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An index to the seventy-ninth volume of The Railway Gazette *covering the issues from July 2 to December 31, 1943, has been prepared, and is now available free of charge on application to the Publisher*

GOODS FOR EXPORT

The fact that goods made of raw materials in short supply owing to war conditions are advertised in this paper should not be taken as indicating that they are available for export

NOTICE TO SUBSCRIBERS

Consequent on the paper rationing, new subscribers cannot be accepted until further notice. Any applications will be put on a waiting list and will be dealt with in rotation in replacement of subscribers who do not renew their subscriptions

POSTING "THE RAILWAY GAZETTE" OVERSEAS

We would remind our readers that there are many overseas countries to which it is not permissible for private individuals to send printed journals and newspapers. The Railway Gazette *possesses the necessary permit and facilities for such dispatch*

We would emphasise that copies addressed to places in Great Britain should not be re-directed to places overseas

TO CALLERS AND TELEPHONERS

Until further notice our office hours are:
Mondays to Fridays 9.30 a.m. till 4.30 p.m.
The office is closed on Saturdays

ANSWERS TO ENQUIRIES

By reason of staff shortage due to enlistment, we regret that it is no longer possible for us to answer enquiries involving research, or to supply dates when articles appeared in back numbers, either by telephone or by letter

ERRORS, PAPER, AND PRINTING

Owing to shortage of staff and altered printing arrangements due to the war, and less time available for proof reading, we ask our readers' indulgence for typographical and other errors they may observe from time to time, also for poorer paper and printing compared with pre-war standards

Home Railway Revenues and Dividends

WITHIN the next few weeks the boards of the main-line railway companies and the London Passenger Transport Board will meet to decide the final dividends for 1943. The Stock Exchange is expecting the L.M.S.R. payments to be made known on February 9; those of the L.N.E.R. and Southern Railway on February 17; and that of the G.W.R. on February 18. Because of the operation of the financial agreement with the Government for the control of the railways, the general assumption is that there will be little change in the rates of payment announced a year ago, notwithstanding the fact that there is every indication that the total net revenue for last year was greater than ever before. *The Financial News* understands that the net revenue for 1943 will be of the order of £120,000,000, which would compare with £89,100,000 for 1942, and £65,100,000 for 1941. Should this prove correct, after the deduction of the £43,000,000 rental for the major railways, and a further £500,000 for minor controlled railways, the Exchequer will benefit to the extent of some £76,500,000 in respect of 1943. In respect of 1942 the Exchequer received £45,600,000, and for 1941 its share was £21,600,000.

The Future of British Inland Transport

The main problem to be solved in devising a properly co-ordinated system of inland transport after the war is that of road-rail competition. Starting from this basis, Sir James Milne, Chairman of the Railway General Managers' Conference, in an article published last week in *The Daily Sketch*, welcomed the recent assurance by Lord Leathers that the Government in deciding its post-war transport plans will be influenced solely by practical considerations. He points out that there are many serious difficulties to be overcome in effecting co-ordination with road interests, but the recent decision of the road industry to form a National Road Federation is an encouraging sign and the railways intend to discuss with it the best means of effecting co-ordination. Much useful work has been done already by the Road-Rail Conference on matters such as conditions of carriage and in preparing the data required for a new classification and rates structure, but the wider aspects of the problem have not yet been examined. An essential preliminary to any scheme of co-ordination is that road hauliers, other than small undertakings operating local services, must be prepared to assume responsibilities imposed on all transport undertakings performing a public service. Sir James Milne points out that nationalising all forms of transport or transferring ownership to one or more public trusts would not solve the road-rail problem. The railways and the new Road Federation will be able, he hopes, to make a joint recommendation to secure the desired co-ordination.

Lord Brabazon on the Future of Railways

Lord Brabazon, a former Minister of Transport, has contributed an article to *The Sunday Express* entitled: "How we can improve the railways." He points out that whether the railways are to be nationalised, run by a national traffic corporation, or remain great public undertakings, a return on capital must be allowed for, unless the State subsidises. Many of the courses advocated by Lord Brabazon to improve the railways were already in process before the war, and there is no doubt that they will be continued when peace returns. Into this category, for instance, fall electrification, advanced booking of seats on trains, improved first class accommodation, better amenities at stations, and so forth. There is, in fact, very little that Lord Brabazon puts forward that the railways have not already in hand, and probably the crux of the matter is to be found in his final sentence, in which he says that "an assured future for the railways will galvanise them into great activity." One of Lord Brabazon's points, elimination of private owner's wagons, has been proposed as desirable by the railway companies for a good many years. Sir John Aspinall, General Manager of the Lancashire & Yorkshire Railway, dealt with it at some length in his presidential address to the Institution of Civil Engineers as long ago as November, 1918, and it had received attention before then.

The Machine Tool Industry in Post-War Years

The importance to Great Britain of the extensive machine-tool industry which has been developed in this country during the war is not always fully realised, but as a gain to the nation's wealth and producing capacity it represents a very real offset to wartime losses of physical equipment. In 1939 the British machine-tool trade, for the most part, specialised in a relatively small number of lines, and many of the requirements of British industry for machine tools had to be covered by imports from Germany and the United States. *The Financial News* in a recent article points out that lack of an adequate machine-tool industry was one of the most serious bottlenecks in the earlier

days of our war effort, but that since 1939 the British machine-tool industry has developed beyond recognition. There can be no doubt of the need for retaining a machine-tool industry as it has developed during the war and converting it as far as possible to peacetime requirements. With an industry highly developed, Great Britain will be in an incomparably better position than ever before to create new industries at short notice, and to expand existing industries without drawing on foreign exchange resources. Indeed, after satisfying the abnormal needs of reconstruction, the British machine-tool industry should be able to export on a large scale, and, in course of time, might become one of our principal exporting industries.

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Importance in Industrial Development

Because of the expansion which has taken place in the British machine-tool industry, the planning of our industrial development after the war will be less dependent than would otherwise have been the case on our foreign exchange resources, and on the willingness and ability of the overseas machine-tool industries to satisfy urgent requirements in this country. It has been said that a nation with a highly developed machine-tool industry has its destiny in its own hand. It can turn its resources to whatever it needs most—factory equipment, agricultural implements, fittings for housing schemes, consumers' goods, and, if necessary, war materials. If its industries require more imported raw materials it can create lines of industries to produce greater exports, or, if necessary, to replace foreign goods and release foreign exchange for the purchase of additional raw materials. With the help of her enlarged machine-tool industry, Great Britain will be able to repair her damaged cities, to renew worn-out equipment and to replace used-up consumers' goods in a shorter time than would have been possible with the aid of her undamaged pre-war equipment. From this point of view, at least, the gain achieved by the wartime development of the machine-tool industry outweighs our loss of productive capacity.

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British Overseas Post-War Trade

Sir Francis Joseph, a Director of the London Midland & Scottish Railway Company, and Acting Chairman of the United Kingdom Commercial Corporation, addressed a meeting of the Association of British Chambers of Commerce in London recently, and took the opportunity to speak of the possible place of the Corporation in the post-war years. He said that although the Corporation was a wartime organisation, there were three factors which would decide its future. They were: what the Government would want it to do, when controls would be removed, and the measure of co-operation between Allied Governments when the war ended. As his personal opinion he said that he could not see a quick de-control of industry or commerce after the war. He thought it would be gradual, but the day would be hastened when controls would cease by a spirit of co-operation in our industries. He, and most of his fellow directors of the U.K.C.C., were convinced that private enterprise could render great service when the war was over. He also urged British manufacturers and commercial representatives not to handicap the development of goodwill between the British and American commercial communities by harbouring suspicions which should not, and need not, exist. The tremendous problems which would have to be faced when the war was over would need a joint effort for their solution.

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The Railways of Tanganyika

Copies of the annual financial statement of the Tanganyika Government Railways for the year ended December 31, 1942, have not yet reached this country, but reports received from American sources indicate that the total revenue derived from railways and ports is shown at £1,116,000, or an increase of 33 per cent. over the previous year. Total expenditure at £920,000 was up by 24 per cent., so that it appears that the total operating ratio has improved substantially. Goods traffic earnings at £638,000 comprised 67 per cent. of the total railway earnings of £954,000; the last-named figure compares with £728,510 in the financial year 1941. Expenditure on railways alone totalled £778,000, of which £276,000 represented debt charges, £100,000 renewals contribution, and £94,000 expenses under the heading of way and works. Revenue and expenditure for the succeeding three months, to March 31, 1943, amounted to £294,000 and £278,000 respectively. Both figures were considerably in excess of the comparable totals for the first quarter of 1942. Revenue from the railways alone totalled £254,600, while revenue from ports, including wharves and marine income, amounted to £39,700 for the January-March period of 1943.

London Transport Rubber Economy

When Japan seized 90 per cent. of the world's rubber supply, two years ago, London Transport grouped all articles having a rubber content into four categories: (*a*) Articles which should no longer be made of rubber; (*b*) Those in which a reduction could be effected in the amount of rubber used; (*c*) Essential articles in which a lower quality of rubber could be used; and (*d*) Essential articles requiring at least 10 cwt. of rubber compound per annum. Tyres for road motor vehicles were excluded, as they were dealt with on a rationed basis through rubber control. A newly-developed process resulted in the substitution for solid rubber of a form of hatting felt encased in low-grade rubber, for such purposes as traction motor nose suspensions, and so satisfactory has this proved that we learn that London Transport may continue to employ this material permanently, subject to the consideration of relative costs. The London Transport Railways Department now replaces broken air brake hoses on an extended time basis, which has been found preferable to replacement on inspection only. The running of full-length trains throughout the day (for reasons not connected with rubber economy) has resulted in an incidental saving in coupling hoses. This department achieved a further reduction in the percentage of crude rubber in the rubber compounds originally employed, by accepting such essential rubber articles as brake piston rings and hoses, escalator handrails, governor diaphragms, and so forth, in the grades proposed in the schedule issued by the Federation of British Rubber & Allied Manufacturers' Associations. Rubber has been eliminated from over twenty items.

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Argentine Railway Fuel Problem

Fuel problems of the British-owned railways in Argentina for some time have been familiar in a general way. Their effects in detail have now been made clear in the papers read by four chief railway officers at the 1943 inaugural session of the Argentine & River Plate Section of the Institute of Transport, and summarised on another page. One paper deals with the Buenos Ayres & Pacific, another with the Entre Rios and Argentine North Eastern treated as one system, a third with the Central Argentine, and a fourth with the Buenos Ayres Great Southern and the Buenos Ayres Western jointly. Shortage of coal supplies and the rationing of fuel oil in each case have compelled recourse largely—though not entirely—to wood fuel with a devastating loss of efficiency and a crippling increase in operating costs. Some railways, however, are better placed than others with regard to supplies of wood fuel, because of their geographical position. In this respect, the Great Southern is, perhaps, in the worst case. The Pacific has the benefit of coal deposits in the province of Mendoza, and these, mixed with Brazilian coal, have been found useful in the boilers of the Central Argentine power house in Buenos Aires. Electrification of its local section has eased the fuel position of the Buenos Ayres Western.

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Diesels for New York, New Haven & Hartford RR.

Some valuable comparisons of different forms of motive power are possible on the main line of the New York, New Haven & Hartford Railroad, on which electric, diesel-electric, and steam power are all in use. The New Haven main line, though only 229 miles long, connects New York and Boston by the Shore Line route, and serves intermediately such important places as New Haven, New London, and Providence. For 72 miles, from New York to New Haven, it is electrified; the remaining 157 miles, between New Haven and Boston, until recently were worked exclusively with steam, but twenty 2,000-b.h.p. diesel-electric locomotives have been acquired, and ten more are on order, for taking over a large share of the New York-Boston express passenger and freight duties. One aim in introducing the diesels, which are described in the current issue of *The Railway Gazette, Diesel Railway Traction Supplement*, was to put into operation locomotives which could be used interchangeably on passenger and freight service. The diesels are coupled in 4,000-b.h.p. twin units, and traction motor gearing suitable for a maximum speed of 80 m.p.h. is fitted.

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Roller Bearing Enterprise

In the year 1931, to give the most convincing demonstration possible of the advantages of roller bearings on locomotives, the best-known of the American roller-bearing firms had a locomotive built, of a thoroughly up-to-date 4-8-4 type with 12-wheel tender, equipped throughout with the company's own roller bearings. This locomotive was then lent to a number of railways in succession for trial, and at the conclusion of the trial period, early in 1933, one of the railways concerned—the Northern Pacific—bought the engine outright. In the following year the Northern Pacific purchased 10 more locomotives of the same type; in 1937 and 1942 11 and 10 more 4-8-4s were acquired, all with roller bearings, and in 1940 eight existing 4-8-4s were converted from friction to roller bearings, making a total of 40

Northern Pacific 4-8-4s with this equipment. Not only so, but 14 articulated 4-6-6-4s with roller bearings were acquired in 1936, 6 in 1940, 12 in 1942 and 10 in 1943, and 9 existing 4-6-6-4s were converted to roller bearings in 1937, and 12 2-8-8-2s in 1940, making 63 articulated Northern Pacific locomotives so equipped. In regard to this one railway alone, therefore, the roller bearing company has every reason to be satisfied with its enterprise, especially after having been successful in selling the original demonstration locomotive. Another railway which is going ahead with roller bearings is the Missouri Pacific. To date 76 of its locomotives have been so fitted; a number of these are conversions from friction bearings, and 10 more engines with roller bearings are on order. It is estimated on the Missouri Pacific that 50 per cent. more mileage between overhauls is obtained by the use of roller, in place of friction, bearings.

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Wear of Cylinder Castings

The cylinders and valves have formed the most complicated and expensive casting in a locomotive, from the earliest days of railways. In spite of vastly increased knowledge of lubrication and metallurgy, many features of cylinder wear are still obscure. The effect of grain size, for instance, is not fully understood. "'Close-grained' cast iron is a fetish," stated one authority shortly before the present war; and he claimed that many irons with comparatively large grain size gave very good results. This is, however, only one of several important influences which must be taken into account in aiming at long life and good performance in a cylinder casting. The difficulties due to superheated steam, though still present, are no longer mysteries; but many years went by before the more subtle problems such as those now traced to "coasting" were solved. Piston rings, too, have been the subject of much experiment, and research on new materials for ranges had reached a very interesting stage when the outbreak of war put a stop to further work in that direction. Further knowledge is also needed on the effect of the thickness of the casting on the running temperatures attained, in view of its obvious influence on lubrication, and hence on wear. In view of the intrinsic value of the cylinder casting, it is to be hoped that further work on these problems will be begun as soon as practicable.

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Optimum Cut-Off

At low engine speeds, when indicator diagrams obtained in practice come near to coinciding with the hypothetical diagram, every advance of the valve gear towards the full forward position leads to an increase in cylinder horsepower. At higher speeds the increase in horsepower is not so certain to materialise; indeed for every speed above a certain minimum there is an optimum point of cut-off and any attempt to use a later cut-off in the hope of securing increased horsepower is doomed to disappointment because the result is a decrease. More positive work is done by the steam, it is true, but more negative work is done due to back pressure during exhaust, and the negative exceeds the positive increment. In driving a locomotive it is useful to know the optimum cut-off for each operating speed; this can be determined by long experience but it can also be found by properly conducted trials. To aid drivers in obtaining the best results from their engines an appliance termed the valve pilot has been used in America. This comprises a speed indicator and a valve gear position indicator, the pointer of which is actuated through a specially-proportioned cam; to make this pointer register with the speed indicator the valve gear must be moved to the optimum cut-off position.

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Merlin versus King Arthur

It is without prejudice to the magnificent work of the Royal Air Force that with a wistful pang some of the older generation realise, after many decades of determination to become engine drivers, and a briefer period when youth worshipped racing motorists, that most boys nowadays are budding "Spitfire" pilots. In a children's illustrated alphabet book we came across recently, in which each letter is represented as standing for several objects, there are no less than three pictures of aircraft (as A stands for aeroplane, H for "Hurricane," and S for "Spitfire"), but no mention is made of locomotives, nor of any railway subject. Strangely enough for this motor-minded age, road transport also fails to get a look-in. Would it be safe to say that, even ten years ago, no publisher would have accepted a book intended for the younger generation which made no mention of the romantic iron horse? We suppose that times must change, and with them literature for the young; but some of us, admiring as we are of the wonderful work of our women to-day, will find it hard to reconcile the betrousered land girl, with her electric milking-machine, with the rosy-cheeked milkmaid, complete with stool and bucket, of the books of our youth!

A Chapter of American Accidents

IT is hardly surprising that criticism and concern should have been aroused in the United States by the number of serious railway accidents that have taken place in that country during 1943. Certain of the fastest and most famous trains have been involved, such as the Twentieth Century Limited of the New York Central, the Congressional of the Pennsylvania, the City of Denver of the Chicago & North Western and Union Pacific, the Panama Limited of the Illinois Central, and the Tamiami Champion of the Atlantic Coast, a second disaster to which, on December 16, 1943, has now been reported. Although some of these accidents, such as those befalling the City of Denver and the Panama Limited, have been due to sabotage, in other cases defective maintenance appears to be indicated. For example, the Twentieth Century derailment at Canastota was due to the bursting of the boiler of one of the latest streamline 4-6-4 locomotives, through low water level and overheating of the crown sheet, though almost miraculously there were no fatalities or even serious injuries to passengers. In the Frankford Junction derailment of the Congressional, however, the Pennsylvania was less fortunate, for 79 passengers lost their lives, and 103 were injured, as the result of a burned-out journal on one of the cars. It is significant that this car was one of the only two in the train not equipped with roller bearings, and that it did not form part of the set normally assigned to this service, but had been included to meet a special week-end demand. Another point is that the train concerned—the advance section of the Congressional—is not only the fastest on the service, but makes one of the longest non-stop runs in the United States (214·8 miles from Washington to Newark) and had travelled 141·4 miles at an overall average of 67·3 m.p.h. when the accident occurred. No negligence, however, is suggested in the report on this accident.

Although a number of collisions, especially on single lines, have been due to failure to adhere to rules of the timetable and train-order method of working laid down in the Standard Code, under which a large mileage is still operated, a disturbing feature of other collisions is that they have occurred on lines provided with the latest automatic signalling and train-stop apparatus. Indeed, careless driving after a warning has been received and failure to pay attention to both fixed and hand signals account for far more mishaps than mistakes made in the train order working itself, which are very much fewer than many in this country are apt to think. One such accident was the Milan collision on the Atlantic Coast Line, where the second section of the Tamiami Champion streamliner, which had been brought to a stand properly at an automatic signal a little over half a mile from the first portion, the engines of which were taking coal, restarted after 4 min. under the stop-and-proceed rule, which enjoins special caution, but, nevertheless, collided with the first section. Another recent collision was on the Southern Railway in Tennessee, on a single line also equipped with automatic signals and train-stopping appliances, but with the points of passing loops manually operated, as is still very frequently the case; a freight train travelling in one direction was in a loop for a train in the opposite direction to pass, but for some unexplained reason some points leading to a dead-end siding, into which the engine and part of the train had been shunted, were reversed at the last minute, with the result that the non-stopping train was diverted and collided with the standing vehicles. The trainmen denied having gone near the points at the time. The Interstate Commerce Commission's representative recommended the electric locking of all manually operated main-line points on the company's lines signalled in this way. Their application, however, gives rise to a good many technical and operating problems. After the serious collision at Tortuga, California, on the Southern Pacific Railroad on September 20, 1938, dealt with at length in our issues of January 27, and July 28, 1939, Mr. A. D. McDonald, President of the S.P.RR., favoured us with his views on the matter, which were to the effect that although there were no fewer than 2,500 locally-operated points on single lines on his system, accidents at them were extremely rare, and the expense of applying the complete equipment with dispatcher's control, essential if delays were to be eliminated, was not justified.

Considerable editorial comment has been appearing in United States newspapers on this chapter of accidents. It so happens that one of the passengers in the derailed Congressional was the editor of the *New York World-Telegram*, Mr. Roy Howard, head of the Scripps-Howard chain of newspapers, and the comment in these papers is inclined to favour the deceleration of express trains during the war emergency. Although a certain amount of slowing-down of long-distance trains has taken place, many services are still maintained at the very high speeds which obtained up to the outbreak of war. A recent issue of our

American contemporary *Trains* gave details of a run on the Milwaukee Hiawatha streamliner, for example, on which, in recovery of a late start, the driver of a 4-6-4 steam locomotive, with 14 cars, ran 47·8 miles of the Milwaukee—Chicago run at an *average* speed of 104·9 m.p.h. Normal running speeds on the electrically-operated New York—Washington service of the Pennsylvania, on which the Advance Congressional was derailed, are over 80 m.p.h. between almost all stops. To attempt any general deceleration of long-distance passenger and freight services in the U.S.A. would so upset coach rosters and wagon turnround times as to cause acute difficulty in meeting present transport demands, and it is for this reason, no doubt, that schedules in general have been maintained. Most of the American press comment on the recent increase in accidents has not been unfavourable to the railways; attention has been drawn to their splendid achievements in handling war traffic, notwithstanding the strain on equipment, and the inadequate supply of material and labour, and it has been suggested that a different attitude of the Government to the railways in these respects might have assisted in averting such misfortunes. It is also well that the frequency of these accidents should be viewed in relation to the vast extent of the American railway system as a whole, in order that a due sense of proportion may be maintained.

New South Wales Government Railways

IN his report on the New South Wales Government Railways during the year ended June 30, 1943, Mr. T. J. Hartigan, the Commissioner for Railways, states that total earnings amounted to £34,071,958, and exceeded those of the previous year by £6,385,626. He points out that the record revenue was largely attributable to the heavier movement of personnel, munitions, and supplies for the defence services, and to increased traffic in materials and equipment for the operation of war plants and essential civilian industries. During the year the rates charged for the conveyance of goods for defence purposes were reduced, but the greater volume of business dealt with was sufficient to ensure a satisfactory financial result. Passenger journeys in 1942-43 numbered 237,441,277, an increase of 18,594,823 over the preceding financial period; and goods tonnage rose from 17,854,519 tons to 18,845,956 tons. Coaching revenue increased by £2,127,742; goods and livestock revenue by £3,853,764; refreshment-room receipts by £179,250; and miscellaneous revenue by £224,870. Working expenses amounted to £27,343,105, against £21,712,560. Below are given some results compared with those for the previous year:—

	1941-42	1942-43
Passengers	218,846,454	237,441,277
Goods and minerals, tons	17,854,519	18,845,956
Operating ratio, per cent.	78·42	80·25
	£	£
Coaching traffic receipts	10,638,485	12,766,227
Goods traffic receipts	14,386,476	18,240,240
Total earnings	27,686,332	34,071,958
Working expenses	21,712,560	27,343,105
Profit on operations	5,973,772	6,728,853

Increases in working expenses due to circumstances beyond the control of the Commissioner included rises in wages and salaries due to variations in the Federal basic wage and the State living wage, and to various awards, which accounted for £846,000; Federal pay-roll tax (£40,000); and higher costs of materials, which, in the case of coal, accounted for £144,000, in that of steel and iron for £150,000, and, in respect of other items, for £300,000. The total of these increases therefore was £1,480,000. In addition, the working expenses included £4,884,000 (against £2,276,000 in the previous year) for provisions to cover deferred maintenance; holidays due to the staff but not taken; and stores and refreshment-room reserves. A sum of £350,312 was included in the working expenses for the writing-off of displaced assets. After these provisions, and after payment of all statutory charges, including interest, exchange, and sinking-fund contributions, the disclosed surplus for the year was £774,542. Concessions in fares amounting to £15,692, rebates in freight rates totalling £399,244, and reductions in rates for livestock of £188,442 were allowed by the Department of Railways during the period in question. As from March 3 last, the Government Railways were proclaimed a "protected undertaking" under the National Security (Man-power) Regulations. Special measures were taken to overcome the position created by the prevailing manpower shortage. Working hours generally were extended, in many cases to the limit permitted under the Regulations; and maximum annual leave of two weeks was allowed, the balance to be accumulated for clearance at a later date. In conformity with the desire of the Commonwealth Government to conserve coal and manpower, the restrictions existing on travel within the State were continued; and further reductions in services were made in October, 1942, on the Illawarra line to Wollongong, on the South to Goulburn, on the West to Lithgow, and on the North to Singleton. During the year, 36,674 main-line mail and passenger trains were run, a decrease of 5,221 compared with the previous year. On branch-line services the number of trains was reduced from 37,164 to 28,686. In view of the large increase in passenger journeys, the services available to the public at times were seriously congested.

Standardisation of Signal Aspects

ON another page is published a letter from a correspondent urging a greater degree of standardisation of signal aspects and uniformity in signalling methods. As to constructional details and the differences in mechanical design which, as he points out, made the signals of the pre-grouping railways so distinctive, these are gradually being eliminated, although a considerable time must elapse before the process is complete. The agreed British standard upper-quadrant design has been accepted by three of our groups for all new work and replacements. So, too, we have attained to a fairly uniform use of the two types of running signal, although there may be examples here and there, legacies from much earlier times, of what our correspondent feels is a superfluous duplication of distant signals. It is true that many years ago, on some railways especially, it was thought necessary to instal many more signals than are now called for and indeed on more than one line a systematic elimination of redundant signals in recent years has been effected. It must not be supposed that there was not often some good reason for installing the signals originally. There was, when the operating principles then current are taken into account, and the small use made of electrical adjuncts for holding the road and so on. Nevertheless the practice at times was carried to extremes.

There is some ground for the view that further uniformity is possible and indeed desirable; for diversity, as such, possesses no advantage in a case of this sort, although we must make allowances for the needs of the various railways, on which traffic operating requirements are not always precisely the same. Signal aspects form a subject on which everybody likes his own ideas best, and this no doubt partly explains the present situation, both here and in other countries. In Great Britain the principal diversity is seen in the realm of ground signals, where we find mechanical types, colour lights, and position lights, variously worked, and for our part we have felt for some time that the elimination of coloured lights from such signals and the adoption of a system of signalling by position only would be an improvement. It would then be possible to be consistent in the use of the standard signalling colours, which can never be adapted logically to shunt aspects. A compromise must always be effected. Nevertheless we doubt if a complete and rigid uniformity will ever be attained, as the development of rail transport, which will bring further changes in the future, will pose new problems for the signal engineer and his signals may be called on to convey more messages than those now deemed sufficient. The problem, therefore, most likely will remain.

The Will to be Safe

IN the course of a recent address to the Safety Section of the Association of American Railroads at Chicago, Mr. Armstrong Chinn, Chief Engineer of the Alton Railroad, gave a remarkable analysis of the human traits that may give rise to injuries or fatalities to men on duty. In the maintenance of way, only 15 to 20 per cent. of the accidents result from unsafe conditions. Despite the fact that men are born with an instinct for self-preservation, it is evident that they will not use that instinct to the full apart from training, and this training in safety-mindedness is just as necessary as the lengthy technical training that prepares a man to carry out his particular job. The tyro is not the only problem. At the time of the depression, the Alton was engaged in carrying out an extensive track improvement programme in preparation for higher speeds, and put on several extra track gangs for this purpose. A number of hands from the locomotive and coach shops, at that time stopped for lack of work, were allowed to work in these gangs. Statistics revealed that the number of personal injuries had not increased, and that almost all those sustained had been by the old permanent way hands, and not the temporary men. The latter had had some safety training in respect of their permanent way work; but of greater importance was the fact that in their work in the shops they had become safety conscious.

Some of the traits cited by Mr. Chinn as productive of carelessness were the following. First comes mental make-up, partly

inherited, partly the result of environment; the former cannot be changed by outside influences, but the latter can respond to leadership and training. Next there is physical make-up, which includes constitution, build, present health, and the influence of past ill-health. In his total make-up a man may be naturally slow-witted and of little value in an emergency; he may, on the other hand, be restless and dynamic, looking for some outlet for his energy, whether it be competition or a fight. Men have different attitudes to life; one may be a mental dwarf who wants to look big; another may know better, but decides to leave it to his foreman to do the worrying; a third may be resentful at some real or imagined grievance; a fourth may not be sure of his job, and may be worrying as to whether or not it is secure. The quality of leadership has a strong bearing on safety; it may vary from the poor leadership of the foreman who acts against the better judgment of his men to that of the domineering foreman who reduces the morale of his men to a low ebb.

Mr. Chinn next discussed the most effective means of making men safety conscious. He gave it as his opinion that men can be surrounded with so much safety that their sense of danger is weakened. It is wise, in preaching safety, to be careful not to destroy the sense of awareness of danger at the same time. The men should be kept continuously interested in safety, to such a degree as will cause them to talk about it amongst themselves. Permanent way maintenance men work to a large extent in isolated units, and it is not always possible to get them to meetings at which safety methods are described and discussed; the onus must therefore lie largely on the foremen who are with their men every day. A foreman must first win the respect and confidence of his men if they are to feel that he has their best interests as well as his own at heart. Safety posters, signs, and slogans have their uses; discussions of safety practices, in which the men are led to express their own ideas, are also valuable.

The New Tanganyika Transport Council

COMPLETE official details have recently been received in this country of the constitution last August by the Governor of Tanganyika Territory of a body known as the Tanganyika Railway & Ports Council, which replaced the Tanganyika Railway Advisory Council and the Ports Advisory Committee. This council consists of the Financial Secretary (who is *ex officio* Chairman), one senior Government official to be appointed by the Governor, and six non-official members to be appointed by the Governor. The General Manager of the railways is not a member of the council, but has the right to attend and speak at all its meetings, and has, moreover, the right of appointment of the Secretary of the council (who is not a member of it), subject to the approval of the Chairman. No specific duration for holding office applies to the official members of the council, but each non-official member is intended, ordinarily, to hold office for 2 years from his date of appointment. Questions before the council are to be decided by a majority of votes, and the Chairman has no second or casting vote. It is also provided that any member whose personal interests may be affected by any question under consideration shall so inform the council, and may be asked by the Chairman to withdraw from the council, temporarily, while a decision is being reached, or to refrain from voting.

The council is empowered to make recommendations to the Governor upon any matter concerning the Railway Administration, including the ports services for which the General Manager is responsible in his capacity as Chief Port Authority. It is laid down that the following matters shall be referred to the council by the General Manager: Any substantial alteration in the tariff of rates, dues, fees, fares, or charges; all Government Bills relating to the Railway Administration prior to submission to the Legislative Council; all schemes relating to the expansion and development of the Railway Administration; any substantial change in the organisation of the staff; the draft annual estimates of revenue and expenditure (including all provision for loan services) and all applications for supplementary warrants in excess of £750—these will be submitted to the council before being submitted to the Government; and the expenditure of any sum exceeding £750 in respect of any one railway or port work or service other than a work or service covered by sanctioned working estimates or carried out under an authorised construction, betterment, or renewal programme.

The council may invite members of the public, or members of public bodies, to attend its meetings for consultation upon any subject, and also may invite any officer of the railway to attend for the purpose of any particular discussion. The General Manager of the railways is to be the medium of communication between the council and all Government Departments and the public. Full details of procedure are set out in *The Tanganyika Territory Gazette* for October 13 last. It would seem that the new council is intended to occupy an important place in the development of Tanganyika Territory, and to exercise wide supervision over the activities of the railway General Manager. As in many other matters of this kind, the success or failure of the arrangements would seem to be dependent very largely upon the personalities of the General Manager and the Chairman, and their ability and willingness to co-operate. The extent of the Tanganyika Railways system was indicated in the map we published in our issue of November 19 last (page 517).

Jet Propulsion and Land Transport

JUDGING by the enthusiasm with which the popular press has hailed the recent official statement on jet-propelled aircraft, the lay reader might easily be led to imagine that this form of propulsion in the near future will supersede other forms, not only for aircraft, but even for land vehicles as well. A little consideration, however, will show that such a revolution in the field of mechanical engineering is not likely to occur. Quite apart from the obvious inconvenience of having a jet of hot gas issuing from the back of the vehicle, there is a grave objection on grounds of efficiency and fuel consumption.

Any system of jet propulsion using a small high-speed jet of exhaust gas is likely to compete on grounds of efficiency with the more conventional engine and propeller only at speeds above 300 or 400 m.p.h. At low speeds it would be ruled out altogether because of excessively high fuel consumption. Even the conventional propeller or airscrew which has been universally employed on aircraft for the last 40 years is unsuitable for land vehicles where speeds are generally restricted to below 100 m.p.h.

A feature of much greater interest to mechanical engineers than the introduction of jet propulsion for aircraft is the probability that the development of this form of propulsion has also involved development of the internal-combustion turbine. It is noteworthy that many of the patents taken out before the war in connection with jet propulsion featured gas turbines.

The internal combustion turbine will almost certainly have a wide application in future to many branches of engineering; it has in fact already been applied experimentally to a locomotive in Switzerland. If the development of jet-propelled aircraft has involved research and development on the many metallurgical and aerodynamical problems involved in gas turbine design, it may well have a profound effect on other forms of transport.

Railway Air Services

THE recently-announced appointment of Mr. Dennis H. Handover as Air Adviser to the four British main-line railway companies, as from the beginning of this year, is an earnest of the fact that the British railways today are transport companies in the widest sense, and take advantage of every new development in the field of transport to enable them to provide the passenger and the trader with the most efficient co-ordinated service in the realms in which their interests lie. Because of the fact that railway air interests are geared to the war effort, and for the moment are largely secret, it is apt to be forgotten that they have ten years of experience in air operation. During the three years ended June, 1943, the companies associated with the railways have operated more than 4,000,000 aircraft miles, and have conveyed 163,000 passengers, and 4,000,000 lb. of urgent mail and freight. Several of their pilots have upwards of a million flying miles to their credit, and this unspectacular but efficient service has played no small part in maintaining the air communications of the country under the most difficult conditions.

The British railways today are interested in 16 air companies, and have contributed nearly three quarters of a million pounds to the development of air transport. The restricted services permitted at present are being worked by five only of the associated companies, of which the principal is Railway Air Services Limited, a company formed jointly in 1934 by the four group railways and Imperial Airways Limited. The British Overseas Airways Corporation (as successor to Imperial Airways) is still represented on the Board, and since 1936 Coast Lines Limited has been a shareholder and nominated a director. Thus, several well-known cross-channel shipping companies are associated with the railways in the development of air transport. Mr. Handover, whose connection with British commercial aviation covers nearly a quarter of a century, will advise on the plan of wide expansion which the railways are preparing for introduction immediately conditions are suitable, and will add his own wide knowledge to that already possessed by the railways as to the possibilities and limitations of commercial air services.

LETTERS TO THE EDITOR

(The Editor is not responsible for the opinions of correspondents)

Simplification of the Railway Rates Structure

Burma Railways,
Office of the Traffic Manager,
Simla, India. December 23

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—I have read with interest certain articles in *The Railway Gazette* on the simplification of railway rates, and the last one I have before me, entitled "An Introduction to Bifurcating Scales for Railway Rates" in your issue dated September 24, 1943, brings me to record the proposals I have drawn up for a revised rates system for the Burma Railways, which is similar in principle to the French Railways system recorded in the above-mentioned note. The proposed rating system takes into account all the peculiar conditions likely to arise in starting afresh and may require further revision after some years of trial.

Briefly, the simplification consists of:—

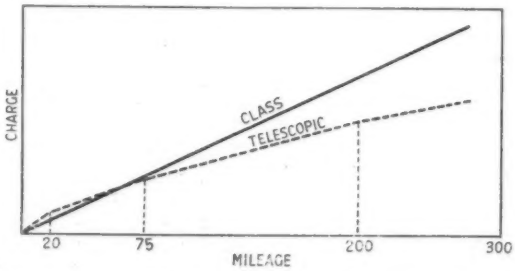
(*a*) a greatly reduced classification of goods commodities, and
(*b*) a rates structure consisting of 7 telescopic schedule scales instead of 16 standard class rates. Of these five are "100 viss" rates and two lower "ton" rates for low class articles in wagon loads.

On the Burma Railways the rates system followed the principles laid down by the Indian Railway Board. The classification consisted of some 2,800 items, a large number cross-references of doubtful necessity, and standard class rates number 16, round which has sprung up in the last decade in Burma, due to severe competition, some 20 or more telescopic schedule, and over 250 exceptional or, as is better known out here, "station-to-station" rates. It can well be imagined what a chaotic state of affairs existed with all these various schedule and exceptional rates in the tariff, a great many of which in the course of time became "dead" rates and should have been removed if we had had the necessary machinery to examine and deal adequately with this question.

Adverting to (*a*), there is no difficulty in reducing a classification and, in so doing, it has been borne in mind that when the railway again functions to obtain revenue, it will be somewhat similar to the opening of a new line of railway, and, therefore, a classification of as few a number of commodities is all that is necessary. As time goes on, the classification can be built up gradually and not overburdened in the initial stages with articles entirely foreign to the country.

As regards (*b*), conditions were peculiar in Burma. There was, and is likely still to be, a road, rail, and river system of transport running directly through its centre. In devising the proposed rates structure I have borne in mind certain conditions brought about not only by road and river transport, but also the necessity to taper rates at longer distances, for many articles, particularly of low value, cannot move at the standard class rates. So without going into a great deal of detail for each of the 7 scales, it may be briefly explained that they drop, so far as the five "100 viss" scales are concerned, at 20, 75, and 200 miles, and the two "ton" scales at 100 and 150 miles respectively. All these schedules have been so planned as to rise more steeply than existing class rates for the first 20 miles and tapering gradually at the above mileages.

The figure below shows a class and a telescopic rates line (not to scale).



As it is hoped that all transport in the new Burma will be co-ordinated and controlled, the necessity for exceptional rates will not arise to the same extent as when there was unregulated competition. In fact, such exceptional rates should be very few, thus making for simplification.

In Mr. Roger Gibb's article quoted above, I notice that the principle he suggests is somewhat similar to mine up to a point. He says the tapering rates were used in France and that he found they "rose more steeply than the normal scales at short distances but tapered off more quietly, after say 50 miles, so that at greater distances these scales cut across the normal scales." This is none other than a telescopic scale and is exactly what my proposal amounts to.

As to Mr. Roger Gibb's explanation of his bifurcating scales, there was a practice on the Burma Railways of applying one telescopic or standard class scale for a certain mileage, and for distances over that mileage another lower scale would apply; thus again demonstrating that that particular article either could not move at long distances or that there was competition. This device, in fact, is being used in my proposed rate line for rice because of the conditions peculiar to this traffic.

Yours faithfully,
E. I. MILNE,
Traffic Manager

American Travel

Hatch End, Middlesex.
January 1.

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—In the attack made by "Statistician" in your December 31 issue on Mr. Bernard Newman for his eulogy of American railway travel, which is stigmatised as "rushing into print with dogmatic statements" about questions which he "had not taken sufficient time to examine thoroughly," "Statistician" himself appears to come under precisely the same condemnation.

First of all, to suggest that the decline in United States passenger revenue gives the lie to American appreciation of the railway facilities of that country takes no account of (a) the depression in trade, one of the worst to befall any single nation in history, from 1930 onwards; (b) the vast development of cheap motor-car traffic in the U.S.A.; and (c) long-distance air competition, on a scale unknown in Great Britain. Were the railways of this country, less affected on all these counts than those of the U.S.A., able to arrest their decline in passenger traffic by their "cheap fares and a frequent service of trains," which "Statistician" advances as their superior attraction?

Also, is it true that British fares *are* so cheap in comparison with those of America? At the outbreak of war, the standard British third class fare was 1½d. a mile *plus* 5 per cent., or 1.575d. The equivalent American "coach" rate, at the then ruling exchange of $4.86 to the £, was 1.17d. a mile. On many long-distance passenger journeys in the U.S.A., this entitled the passenger to an individual reclining chair, adjustable to any angle, without supplementary charge. Up to the time of Pearl Harbour, the practice was increasing steadily of marshalling such chair cars into complete one-class-only streamline trains with dining cars and buffet lounges which were run at speeds up to those of the principal all-Pullman flyers on the same services. The use of reclining chairs provided comfortable lying-down accommodation throughout each train at night.

It might be inferred from "Statistician's" letter that American railways had only just "discovered" the single-room sleeping car by 1940. By that date hundreds of single-room Pullman sleepers were in use in all parts of the U.S.A. offering a wide variety of accommodation at proportionate supplementary fares. The older convertible cars, with their upper and lower berths, "sections," and "drawing rooms," were introduced to meet the heavy demand for sleeping accommodation on the many trains travelling through both the day and night; but these are now supplemented with single-room cars made up of "roomettes," duplex rooms, single and double bedrooms, compartments, and, on certain luxury trains, master rooms.

Study of the American "Official Guide" shows that on the New York Central, Pennsylvania, Burlington, Santa Fe, Union Pacific, Southern Pacific, and many other railways, practically all the sleeping-car trains have a proportion of their sleeping accommodation in single rooms, and a number of the more famous trains are made up almost exclusively of single-room cars.

Between New York and Chicago, up to 1940, a "roomette," with every convenience, including individual hot and cold water, cost 1.85d. a mile, as compared with 1.80d. a mile for third class sleeping accommodation between London and Edinburgh or Glasgow, four in a compartment, with sheets and blankets only, and communal washing arrangements. Single occupancy of a double bedroom in a U.S. Pullman sleeper, even on so exclusive an express as the Twentieth Century Limited, with special service charge, cost 2.38d. a mile inclusive; and a man and wife, or two friends, could enjoy the luxury of a master-room suite, with their own shower-bath, for 2·46d. a mile.

By comparison, the British first class sleeping car rate between London and Glasgow or Edinburgh, fare *plus* berth supplement, worked out at 3.25d. a mile at the same date.

"Statistician" speaks of a "few long distance trains" in the United States as though this were the whole story of American luxury rail travel. In *The Railway Gazette* of September 11, 1942, details were given on 75 luxury streamline services in the U.S.A., the majority of them booked at high overall speeds, which required over 130 complete set trains for their operation; and since then further services have been added. Although the average speed of all British main-line travel was probably greater

than that in the U.S.A. up to the outbreak of war, and also the frequency of service, the fastest of these American streamliners (many of which are still running at the same speeds) held a considerable lead over the fastest in Great Britain, of which only the Coronation, Silver Jubilee, and West Riding Limited on the L.N.E.R., the Coronation Scot on the L.M.S.R., and the Bristolian on the G.W.R. could be regarded as in the same special streamline category.

As to restaurant car service, it hardly seems a fitting subject for *complaint* that American dining cars should serve a wide variety of *à la carte* meals. As one who has more or less lived in trains for 35 years and travelled over 1,600,000 miles, I have often longed for some variation of the eternal sameness of the British table d'hôte. Certainly more variety than before was offered in British restaurant cars during the last decade before the war, but the *à la carte* menus introduced on the L.N.E.R. streamliners were a welcome development. So was the provision of both buffet and restaurant accommodation on the same company's Flying Scotsman—a reminder of the fact that most long-distance American expresses have buffet or light refreshment accommodation, as well as dining car, marshalled in different parts of the train.

Compartment or open car must always be a matter of individual preference, or, more probably, national habit. I fancy that "Statistician" might not find his compartment travel quite so "restful" or so conducive to reading or writing were trains to be loaded in peacetime regularly to something approaching their seating capacity. Personally, as one who occupies most of his travel in writing, I make straight for an open car as (a) a car in which, with the good fortune of a single seat, one cannot be cramped, and (b) for the facility of a table on which to lay one's papers. The extensive use of open stock in war conditions makes it probable that this type of car will be more widely favoured after the war than before in Great Britain.

Yours, etc.,
CECIL J. ALLEN

["Statistician's" reference to "cheap fares" was presumably intended as meaning cheap according to our general standards and in relation to the cost of other forms of transport. "Expensive" referred to the railway companies.—ED. *R.G.*]

Standardisation of Signals and Aspects

Banbury. January 5

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—An outstanding feature of British railways, and one that stands out forcibly to the layman, is the multiplicity of signal types and also what seems to be the unnecessary duplication of distant signals, at least in some places.

Dealing with the former point, the practical view would be that the time has arrived for a common policy to be decided on, and this on two grounds—economy of production and greater simplicity for drivers—bearing in mind the number of joint routes in the kingdom. Any virtue which once attached to the individualism of the respective companies, in a utility matter such as this, has long since departed, and there can be now no possible reason for not formulating a common policy, if such has not already been done. The handsome signals of the Great Western Railway, the interesting "somersault" signals of the former Great Northern Railway, and the excellent designs used on the old London & North Western Railway were very intriguing to railway enthusiasts and part of the worthy distinction claimed by the companies. Regrettable though it may be, these days are over, and the time seems to have arrived when colour-light signals will become the vogue. During the period of transition, however, there is bound to be a medley of types in the country, but whether the new designs will be common to the four companies is a matter on which some reassurance is required.

Anyone who has had experience of footplate work will readily appreciate the value of simplification and standardisation, especially at the high speeds now demanded; and although great progress has been made in various directions, as witness the abolition of the large and historic signal gantry at Rugby consequent on the introduction of colour-lights, the final step obviously calls for concerted action on this important matter. Such questions as types, beam intensity, height, disposition, operation, etc., are all possible of standardisation, and this would be greatly to the economic advantage of the companies and the practical advantage of their staffs.

Observers of station working cannot fail to be impressed by the unnecessary duplication of signals, particularly distants. There are cases where the stages are distant, home and distant, platform starter with distant, advance starter with distant, and it would surely seem that some of these indications are redundant and worthy of review. Every extra signal means more maintenance, the consumption of more electric current or oil, and more complication for drivers. One particular instance consists of a home signal with a distant on each side of it; the set is in duplicate at the approach to a country junction, followed by two directing homes at the junction itself. The right-hand distant is used approximately twice a year; but the lamps are re-filled, trimmed, and lighted every day, a procedure more of a ritual than anything else. This is but one example that could be multiplied indefinitely and, it is submitted, shows the need for "rationalising" the whole signalling question.

Faithfully yours,
T. LOVATT WILLIAMS

[See editorial comment on page 32.—ED. *R.G.*]

Menai Bridge & Holyhead

Bordyke, Burgess Hill,
Sussex. January 6

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—In your issue of December 31 last Mr. Kenneth Brown quotes from the 1838 Report (Appendix "A") of the Commissioners for Inquiry into the Best System of Railway Communications through Ireland, that it would be necessary "to horse the railway carriages over [the Menai Suspension Bridge] one at a time."

The Chester & Holyhead Railway, however, constructed the Iron Box Bridge, named the Britannia Bridge, over the Menai Straits so that trains ran through between the mainland and Holyhead. The then terminus was, however, about 1½ miles distant from the steamer pier; passengers and luggage were conveyed from the railway station and the pier by buses, and *vice versa*. After a short time the railway was continued by a harbour and pier branch, with a new station, a timber viaduct half mile long, and a further half mile of tramway to the packet pier.

Herapath in April, 1851, had an interesting article on this extension etc., reputed to have been written by a Mr. Roney, an authoritative writer on railway matters, and engaged by the Chester & Holyhead Railway to tour Ireland to develop the traffic from that island to England *via* Holyhead. The article states that the extension was to be opened on May 15, 1851—"From and after that date, the passengers landing from the steam packets will walk some 30 steps to the railway carriages; their luggage, the mails, and parcels will be at once loaded, when the train will be drawn along the tramway and viaduct by the horse to the station."

If the above be correct, horses were for a time employed to haul railway carriages on the Holyhead line, although not over the Menai Suspension Bridge.

The article gives some interesting and peculiar information about the Tubular Britannia railway bridge over the Menai Straits. "The public will be taken through the tubes, under the control of the company's servants, until a quarter of an hour before each train is due. The public are not to be allowed indiscriminately to walk across the outside [on top] of the tubes. This privilege is only to be obtained under special authority, but about 20 ft. on each "Land Tube" is to be securely fenced off, and the public admitted thereon. This will enable them to see the structure just as effectively as if they were permitted to walk across."

It is not stated what, if any, charge was made for the above-mentioned inspection, etc., of the bridge.

Mentioned in the article was a reference to the accommodation at the new Holyhead Station. The woman in charge of the refreshment rooms there was already a celebrity, and is given greater publicity by name in the article, and by the Chairman of the C.H.R., than has ever been achieved by any one of the railway hoteliers, despite efforts to attain it. The article states "the refreshment departments are to be presided over by one, who, in her way, is as great as the redoubted Soyer—the famous Mrs. Hibbert. We are surprised to learn she deserts the great cradle, of her fame—Wolverton—for the classic retirement of Holyhead Harbour. Nevertheless, such is the fact; and we only make one aspiration on this change—which is that her smiles may be as sweet—her handmaids as charming—and her pork pies as excellent, as the trumpet of fame has proclaimed all three to have hitherto been."

At the meeting of stockholders in the Chester & Holyhead Railway in September, 1851, Mr. S. Morton Peto, the Chairman, said: "When I add that we have removed Mrs. Hibbert and her staff from Wolverton to Holyhead, I think I need only to mention the name of that lady, as having the management at that station, to assure you that every care has been taken to provide for the comfort and well-being of the passengers."

The railway was completed to the steamer pier later; presumably the trains were then hauled through by locomotives.

In 1880 extensions and considerable alterations were carried out at Holyhead Harbour.

Yours faithfully,
G. A. SEKON

The Scrap Heap

Nearly 200 Civil Defence personnel helped to load and unload Christmas traffic on the L.M.S.R.

* * *

Thirty members of the company's clerical staff raised **£58** for the British Red Cross by singing carols to colleagues in the L.M.S.R. Headquarters canteen, during lunch, three days before Christmas. Their object was to help in the replacement of prisoner-of-war parcels which had been lost at sea.

* * *

Mr. Henry King, whose death occurred recently at the age of **108**, was the oldest railway pensioner in Great Britain. In our November 20, 1942, issue it was recorded that, on his 107th birthday, Mr. King was presented with 107 shillings by the Taunton Staff Association of the Great Western Railway.

* * *

Definitions

A Co-ordinator is a man who brings organised chaos out of regimented confusion.

A Statistician is a man who draws a mathematically precise line from an unwarranted assumption to a foregone conclusion.

An Efficiency Expert is a man who knows less about your business than you do and gets paid more for telling you how to run it than you could possibly make out of it even if you ran it right instead of the way he told you to.—*From "600," the staff magazine of George Cohen, Sons & Co. Ltd.*

* * *

Oldest Transport Method?

Some 31½ metric tons of petroleum products from North-West China have arrived in Chungking floating on 1,000 inflated goat skins, marking the beginning of what may be one of the strangest of all transport services in this war. The 168 barrels of oil products comprised the first cargo carried by the new goat skin river raft transport operated by the enterprising Kansu Oil Company, which is the first modern war industry to adopt this oldest form of Chinese river transport on a substantial scale. The flotilla made the last stretch from Kwangyuan to Chungking in 16 days. It consisted of three huge rafts, which negotiated the swift currents of the swirling Chialing River without incident. Drawing less than one foot of water, the curious craft skimmed through rapids and slid over rocks that presented dangerous hazards to other forms of river navigation.

* * *

No fewer than 574 L.M.S.R. drivers engaged in collection & delivery work in London figure in the latest list of awards for safe driving under the National "Safe Driving" competition. It is indicative of the high standard of driving skill and care that 165 of the awards are in recognition of a clean driving record of from five to ten years, and 217 for from ten to twenty-one years. The latter include eighteen men who received a star bar to the Twenty-Years' Brooch which they won the previous year.

* * *

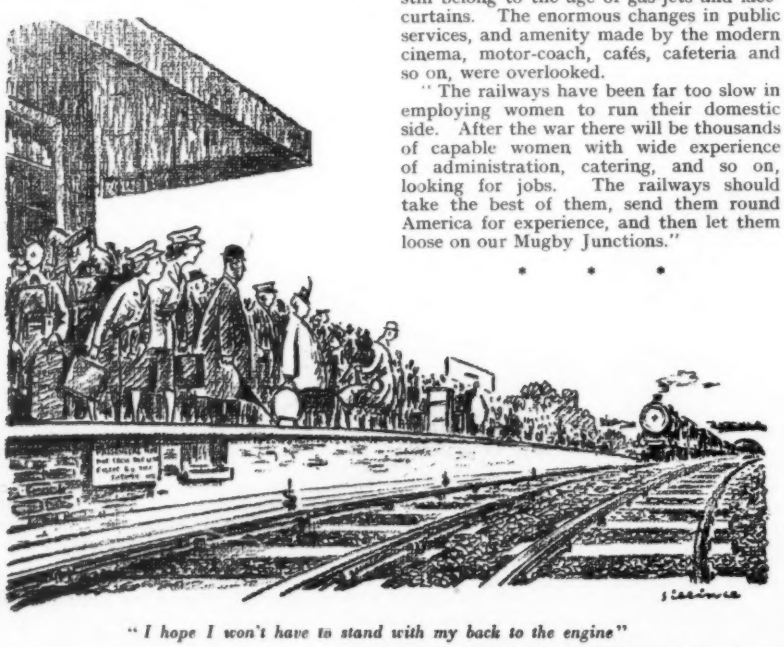
British Railways Criticised

The following criticism of British railways appeared in a leading article in *The Observer* on Sunday, December 26:—

"On the engineering side our railways have usually been excellent. On what may be called the domestic and amenity side they have not. Their huge boards of directors have never kept pace with the changes in the public's ways of living and feeding. Long after the Victorian Sunday had passed into our week-end, they continued apparently to believe that Sunday travel is a form of sin, deserving to be punished by a special service of slow and scanty trains. (The 'bus companies knew better and even doubled their Sunday services). The equipment of stations was utterly behind the times. Who would wait in a station waiting-room without a shudder? Many of the refreshment rooms still belong to the age of gas-jets and lace-curtains. The enormous changes in public services, and amenity made by the modern cinema, motor-coach, cafés, cafeteria and so on, were overlooked.

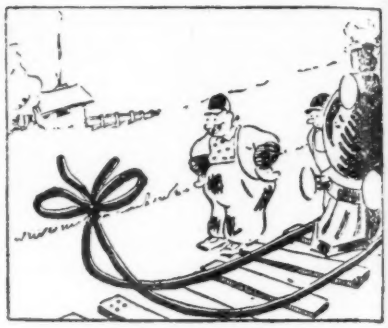
"The railways have been far too slow in employing women to run their domestic side. After the war there will be thousands of capable women with wide experience of administration, catering, and so on, looking for jobs. The railways should take the best of them, send them round America for experience, and then let them loose on our Mugby Junctions."

* * *



"I hope I won't have to stand with my back to the engine"

[Reproduced by permission of the Proprietors of "Punch"



"I'll bet it's those children"

[From "Ferroviarios"

Like most English travellers, Mr. Newman admires the luxury and efficiency of the American railways, though, like me, he prefers the British method of engine driving. The interior luxury, the private rooms, the berths, the dining cars, the parlour cars, and the rest, make this American driving seem all the more extraordinary. The jerks, jars, and jolts that the passenger on an American train suffers every time it starts and stops have to be experienced to be believed. It may, of course, be due to the length and heaviness of American trains, or to some difference in the system of brakes and couplings, but since I found a similar harshness in the handling of American road vehicles I am inclined to think it must be due to a national difference in temperament rather than to one of mechanical construction or driving skill."—*From a review by Mr. Herbert Hodge in "John O'London's Weekly" of Mr. Bernard Newman's book "American Journey."*

* * *

What to Call Them

The urge to know everything and everybody by initials in wartime has been impelling Americans to suggest a title for women railway workers that can be contracted to some snappy word composed of the title's initials. Three suggestions have appeared in our contemporary *The Railway Age*. One is "ARROWS"—"American Rail Road Organisations' Women's Service." A second is "RAILS," for "Railway Aides in Liberty Service"; and the proposer adds, "I think the gals would like it." The most bellicose of the three, however, is "WARS," for "Women of American Railroads"; but it may be wondered how many of the "gals" would like this one!

* * *

Overheard at Carlisle

Recently an aggrieved feminine voice was heard over the Carlisle station loudspeaker system:—"Will the driver of the engine in the Newcastle bay please try to blow off a little less steam, as he is making it very difficult to announce."

The message having been conveyed to that worthy by various bystanders, he obediently succeeded in reducing his noisy steed—a London & North Eastern "Shire"—to silence, probably by the use of the injector.

With barely a moment's silence, however, the refrain was taken up by a "Royal Scot" and a streamlined Pacific of the L.M.S.R., which had just backed into the centre road to wait for southbound trains, and the modest 180-lb. blast of the L.N.E.R. was replaced by a joint effort at 250 lb. to the square inch. The announcer then gave it up in despair.

OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

INDIA

Sind-Pishin Line

In an article published in *The Railway Gazette* of September 17, 1943, in connection with the closing of the Sind-Pishin section of the North Western Railway (which includes the famous Chappar Rift), it was stated that the bridges between Kachh and Khanai were to be converted to the use of road traffic. This plan has been altered, and the bridges concerned are being removed. By the end of November, the removal of Kachh High Bridge (150 ft.) had been completed.

SOUTH AFRICA

Soil Erosion

The Treasury has authorised funds necessary to enable the Soil & Veld Conservation Section of the Department of Agriculture to intensify its film propaganda against soil erosion in the Union. The funds will be devoted to the production of a series of specialised, silent documentary films, which will deal with special problems; the films will be based on the latest scientific experiments, and will give advice on how to prevent erosion, and how to recover land already denuded. The Department of Agriculture is considering the purchase of a self-contained travelling film unit, complete with modern camera and projector, which would travel throughout the Union instructing farmers, and municipalities and other bodies, as to the dangers of soil erosion.

More Travel Restrictions Possible

In a national broadcast made recently Brigadier C. M. Hoffe, General Manager of the South African Railways & Harbours, said that the administration might be forced to remove all sleeping accommodation from main-line passenger trains, and to place eight passengers in each compartment without any distinction between first and second class ticket holders. No detailed scheme had been worked out, but if members of the public insisted on making use of the railways after all the warnings given, they must expect great discomfort and inconvenience. Up to the present appeals for voluntary co-operation from the general public had met with little response. No new locomotive had been placed in service on the South African Railways during the last four years, and the system's resources had been strained to the utmost.

CANADA

Progressive Conservatives and Railway Unification

Mr. John Bracken, leader of the national Progressive Conservatives, in an address at North Battleford, Saskatchewan, recently said that he would be "unalterably opposed" to any movement to unify the two main railway systems in Canada. He thought that they could obtain better service under present arrangements, because of the competition of the privately-owned line with the Government-operated system.

He said that provision would be made by a Progressive Conservative government to inquire into the creation of a fully-integrated system of transport in Canada—a system adapted to furnish the nation with the cheapest and most-effective service possible consistent with the maintenance of the independent identity of the two great railways. The establishment of such a system would keep freight rates as low as possible to help compete with other exporting countries, and would prevent waste due to overlapping of different forms of carriers.

Railway Wagon Loadings

Partly as a result of heavy grain traffic, the number of wagons of revenue freight loaded on Canadian railways during the first nine months of 1943 was slightly above that for the whole of 1942; the figures were 2,883,519 and 2,848,242. The number of wagons loaded with grain during the first nine months of 1943 was greater than that for the whole of the previous year by 74,983.

Apart from grain, only four commodities represented higher totals of wagon loadings in the period under review, compared with 1942; the increases were: livestock, 15,280; coal, 14,982; coke, 2,579; and pulpwood, 7,393. Miscellaneous loadings decreased by 24,223 wagons.

UNITED STATES

Serious Fire at Terminal Station

Remarkably rapid handling of a difficult situation was effected by the Pennsylvania Railroad recently when fire broke out at its Broad Street terminal in Philadelphia. Although the main station and office building fortunately were untouched, the 16 platform lines, with their platforms and canopies, were burned out. The train shed is an elevated structure, and matters were complicated by the fact that the steel substructure had been reinforced heavily with timber after a similar fire twenty years previously.

The fire broke out at 9.30 on a Sunday morning; on the Monday morning at 7 a.m. the first train left for New York from a temporary platform beyond the burned-out area; by Monday night 205 bogie-wagons containing timber and other material had reached the site. At the maximum, 2,200 men were at work, 425 from among the company's bridge-building and permanent-way staff, and the remainder loaned by outside contractors. By Tuesday midnight two of the platforms were in use again, complete with overhead electric equipment. From then on, the station platforms were brought back into use at the rate of roughly two a day. During the emergency, trains were dealt with as necessary at adjacent Philadelphia stations, but none was cancelled.

New Haven Electric Locomotives

Five powerful electric locomotives of the 2-C-C-2 (4-6-6-4) type have been delivered recently by the General Electric Company to the New York, New Haven & Hartford Railroad for service over its electrified main line between New York and New Haven. The new locomotives are each 80 ft. long over couplers and have 4 ft. 9 in. driving wheels, each pair driven by twin-armature motors of 810 h.p., so giving a total h.p. of 4,860. The total weight of each is 220 tons, of which 160 tons is available for adhesion.

As these locomotives are intended primarily for freight service, they are geared for a maximum speed of 65 m.p.h., as compared with the 93 and 80 m.p.h. maxima of the existing passenger units. The specification covered the haulage of 125-wagon freight trains of up to 5,000 tons gross weight between Bay Ridge yard, New York, and Cedar Hill yard, New Haven, with assistance if trains of over 3,000 tons require to be stopped on certain specified grades. If the locomotives are used on passenger service, they are expected to be capable of handling loads of up to twenty 85-ton Pullmans with a heating car (about 1,750 tons) over the 76 miles between the Pennsylvania Station, New York, and the New Haven passenger Station in 97 min., inclusive of two intermediate stops and the observance of all speed restrictions.

New Line in Kentucky

Contracts have been placed by the Louisville & Nashville Railroad for the construction, to main-line standards, of a branch, 10 miles long, up Leatherwood Creek and the Clover Fork valley to a coalmine in course of being opened in Perry County, Kentucky. Heavy work will be entailed, including construction of a tunnel 800 ft. long, and of numerous bridges in steel and concrete, and more than 500,000 cu. ft. of excavation; the total cost is estimated at about $2,000,000. The grading and concrete structures are being let out to contract; but the railway company is to carry out the steel bridgework and trackwork.

C.T.C. on the Southern Pacific

On its Overland route east of Reno, Nevada, used by the City of San Francisco and other important transcontinental trains, the Southern Pacific is installing centralised traffic control over 43½ miles of line between Vista and Massie, Nevada. The control machine for the two-wire control system is to be located west of the existing controlled section at Sparks, Nevada. The installation will include high searchlight and dwarf signals, electric switch movements and electric locks for hand-operated switches, and electric indicators to warn road traffic at grade crossings.

ARGENTINA

Public Works Ten-Year Plan

A decree issued on September 22, 1943, authorised the Minister of Public Works, in collaboration with the federal commissioners, territorial governors, and all national and provincial technical and administrative departments, to make a study of the public works, national, provincial, and municipal, which are considered most urgent, with a view to their inclusion in a programme to be carried out during the next ten years. The Decree made it obligatory on the authorities mentioned to co-operate in obtaining the required information, which had to be presented to the Ministry of Public Works before December 31, 1943. The programme is intended to embrace railways, roads, civil aviation, navigation and ports, electric power, irrigation, agriculture, and posts and telegraphs, classified under the following heads:—

(1) Works which should be carried out immediately.

(2) Works which should be put in hand within the next five years.

(3) Works the completion of which should be effected within the next ten years.

The Decree states that during the last 25 years approximately 4,169,000,000 pesos has been spent on public works, many of which have been entirely unproductive; and that the object of the scheme now being prepared is to ensure that only works of an essential character should be undertaken. Reference was made in *The Railway Gazette* of August 20 last to the drastic curtailment of public works recently ordered by the new Argentine Government.

The Fuel Problem in Argentina in Relation to Railway Operations

Abstract of four papers by officers of British-owned railway companies in Argentina*

Mr. M. F. Ryan, C.B.E., M.Inst.T., General Manager, Buenos Ayres & Pacific Railway

COAL was the fuel which had been mainly burnt in the steam locomotive. For that reason its design had been evolved on a coal basis. The locomotive was a flexible machine and could be adapted to suit almost any type of fuel, but if a coal burner were used for oil or firewood a loss of power or efficiency, or both, resulted. All locomotive engineers liked to burn oil on account of its greater heating qualities, ease of handling, and the long continuous runs which it facilitated. As a rule, where petroleum and coal were found together in the same region, coal gave the most economical return. If railway mechanical engineers were assured of a continuous supply of oil for the life of their locomotives, or say a period of thirty-five years, they would have evolved for oil burning engines a very different type of boiler and they would have obtained the same efficiency from oil that they now got from coal. With inferior fuels such as firewood and maize sufficient power was obtained to do the work, but the full coal power rating of the locomotive could not be realised.

Fuel consumption figures on the B.A.P.R. during the month of April were:—Petroleum 8,000 tons; imported coal 2,000 tons; Argentine coal 4,000 tons; firewood 30,000 tons; briquettes 600 tons.

Coal deposits were found in the Provinces of Mendoza and San Juan. Analyses made in the B.A.P.R. laboratory showed their composition to be very variable, ranging from a type containing 50 per cent. with a heating value of only 2,000 calories to a high class fuel with less than one per cent. of ash and a calorific value of over 9,000, a figure higher than for Welsh coal, which gave about 8,000 calories. In the Rio Grande district of South Mendoza a mine of high quality asphaltite coal, giving between 8,500 and 9,300 calories, was being worked. The existence of 300,000 tons had been proved. The property was situated nearly 300 km. from railhead; but a good road passed within 35 km. of the mine with which it was connected by a proprietary road of first class construction. One 5-ton lorry could convey 50 tons a month, and the current monthly production was about 6,000 tons, of which the B.A.P.R. was obtaining a proportion. The coal was very light and volatile (40 per cent.). To burn it the locomotive fire-grates and brick arches had had to be re-arranged and a very much lower vacuum used in the smoke-boxes. For medium work it gave excellent results, but for heavy engines operating on stiff grades, because of its light nature, it did not serve. By mixing linseed with the coal better results were obtained. The coal was being used on the Buenos Aires suburban services, with considerable inconvenience to passengers, as it was very dirty. Though of higher calorific value than Welsh coal, consumption was 10 per cent. higher.

A very satisfactory fuel now being used on passenger tank engines consisted of briquettes originally made from maize cobs covered with a thick coating of asphalt. The use of the maize nucleus had been discontinued and solid lumps of treated asphalt were now supplied.

During the last war the forests close to the Pacific lines were exhausted, and firewood had now to be sought further afield. In the region where the three provinces of San Luís, Córdoba, and La Rioja adjoined there were extensive forests of "algarrobo." Branch lines totalling 100 km. in length had been extended into this zone from which at present about 1,200 tons of wood a day were being obtained. The heating value of algarrobo was about 3,500 calories as compared with the 4,500 calories of red quebracho, and it required 4 tons of algarrobo to do the same work as one ton of Welsh coal. The cost of coal, when a rare cargo was obtained, amounted to $81 a ton. Algarrobo at $8 a ton on wagon gave $32 of coal equivalent, leaving a margin of $49 a ton. This economy was partly swallowed by the following factors: Much more time was occupied in loading engines; for a given service the amount of wood employed was four times the weight of coal; as the fuel capacity of the tender could be increased only slightly, the engine had to be re-fuelled more often; this involved the establishment of intermediate loading stations between the running sheds originally spaced for coal; wood loading stations were on an average 100 km. apart, as compared with 400 km. for coal; and trains operating on wood had had their loads and speeds reduced by 20 per cent. The effect of these factors was that 43 more engines were required to do the work, and the monthly mileage of each engine was less by nearly 12 per cent. This reacted on the workshops and running sheds where more locomotives had to be maintained and repaired. The increase in running shed staff, including the "pasalenas" (or wood-passers) and the men employed in the supplementary fuelling depots, but not the additional engineman, amounted to 45 per cent. Fire risks substantially increased with the use of wood for fuel. In spark prevention very satisfactory results had been obtained with the B.A.G.S. Railway model of rotary spark arrester, invented by Sr. Saccaggio.

Mr. John Wilson, O.B.E., M.Inst.T., General Manager, Entre Rios and Argentine North Eastern Railways

The normal pre-war fuel requirements of the two companies jointly were some 6,000 tons of coal, 1,050 tons of fuel oil, 230 tons of diesel oil, and 30 tons of gas oil a month. The steam-train ferries consumed some 500 tons of fuel oil a month and the 3 diesel ferries 230 tons of diesel oil. The gas oil was consumed in the diesel coaches and sundry diesel engines, etc. In fixing the quota of liquid fuel, the Government departments had lumped together fuel oil, diesel oil, and gas oil, and as it was impracticable to substitute other fuels on the train ferries, and it was impossible to reduce this service without affecting the whole of the services, the reduction in fuel which should be applied to the ferries in reality became a further reduction in the fuel available for locomotives.

On the two railways the heaviest rail was 75 lb. per yard, but many kilometres of the North Eastern main line were equipped with 55 lb. rails. As the provinces served were undulating with many gradients, conditions were ideal for Garratt locomotives. Some years ago the companies acquired 8 passenger or mixed Garratts and 12 goods Garratts which had proved to be the backbone of the power equipment. Of these Garratt locomotives, 5 passenger and 5 goods were equipped for burning oil and the remainder for burning coal. When the fuel oil shortage became apparent the oil-burning goods Garratts were converted to coal; the coal-burning passenger Garratts were converted to oil, and were concentrated on the services between Ibicuy, Concordia, and Monte Caseros. Today, apart from the passenger Garratts and one shunting locomotive, all locomotives were operating on wood fuel.

Two steam Sentinel coaches were still in operation, one on the Entre Rios and one on the North Eastern, both of which burned coal, as their boilers and fireboxes were unsuitable for any other solid fuel.

The conversion of the ordinary type of locomotive to burn wood presented little difficulty beyond that of tender capacity, and on heavy duty trains the locomotives operated with a firewood wagon immediately behind the tender from which the wood-passer (*pasalena*) transferred the wood to the tender. The conversion of the goods Garratts to burn firewood required some modifications to the tenders and a much bigger civil engineering problem to provide turning facilities, since it became necessary through the use of the wood wagon for these locomotives to run always with the fuel tender at the rear. Only at the two most southerly sheds, Holt and Basavilbaso, were there turntables of a capacity sufficient for the Garratt locomotives, and it became necessary, therefore, to provide turning facilities for these engines at five other sheds —Concordia, Monte Caseros, Mercedes, Guaviravi, and Santo Tomé.

In pre-war days, coal and petroleum were received at Ibicuy, the extreme southerly point of the system, and distributed northwards, that is, in the direction of the lightest traffics. All the wood fuel was at present being obtained from their own provinces, part on the companies' own lines and part on the State Railways through the junctions at Concordia and Crespo. A very large proportion came from the extreme north of the North Eastern system, with the result that the firewood traffic flowed generally in the same direction as the main public traffics. The annual consumption of firewood was estimated at roughly 300,000 tons, representing an increase of 30 per cent. on goods tonnage loaded. The firewood produced in the provinces served by the two railways was of very mixed value and could not compare with the hardwood types obtainable in the northern provinces. For the financial year 1941-42 the fuel bill of the Entre Rios had increased by 95·4 per cent., and of the North Eastern by 88·25 per cent. Part of these increases came from heavier traffics, but the greater part was due to the higher cost of fuel.

* Read at the inaugural meeting of the 1943 session of the Argentine & River Plate Centre of the Institute of Transport, held in Buenos Aires on June 1, 1943

Major R. K. Hubbard, O.B.E., Assistant General Manager, Central Argentine Railway

For about seven years before September, 1939, the Central Argentine had been a 100 per cent. coal-burning railway, as in 1932, because of the increase in fuel-oil prices, the few passenger locomotives which had been operating on oil were converted to coal. For financial reasons and because the company had a potential fuel reserve in the forests on its northern section, it had reduced its coal stock to the equivalent of two months' consumption actually on the ground, 70,000 tons with one month's supply at sea, 35,000 tons. Efforts to increase this stock were made when war broke out but the ground gained was lost when, towards the end of 1940, due to the slump in maize traffic at a time when the company relied mainly on this commodity for its revenue, seven cargoes of Welsh coal had to be sold to raise money for salaries and other non-postponable cash expenditure. Some 5,000 tons of fuel oil a month were obtained which enabled the railway to conserve its coal stock and gain time for the conversion of a large number of locomotives to wood burning.

Under the Government's fuel oil rationing scheme the company was allowed 2,000 tons a month and with this and 2,000 tons of coal a month taken from stocks, and firewood (green white quebracho, for the most part a very poor quality fuel), record traffics had had to be handled. The 4,000 tons of coal and oil a month compared with a pre-war consumption of 35,000 tons. Substitutes such as maize in cob, vegetable oil, linseed cake, briquettes had been used, but the amount had been too small to affect the situation appreciably.

With regard to the electrified services, the standard fuel for which the Babcock boilers in the power house were designed was Welsh washed beans, although crushers were provided to enable large coal to be used in an emergency. Except for shelled maize it was practically impossible to use substitutes such as fuel oil, charcoal, firewood, or vegetable oil seed cake because of the specialised design of the furnaces and chain grate stokers. When available, threshed maize had been used in considerable quantities. The use of maize, however, reduced the boiler capacity both in output and availability —the latter because the boilers had to be out of service for periods of cleaning. Even when maize was available, a certain amount of coal was also required. In default of British or American coal it was fortunate that the properties of Brazilian coal and Mendoza coal were such that a mixture of the two could be used, although it was impossible to run on either by itself.

The fuel problem so far as it affected the steam services meant that as three bulky tons of firewood had to be used in place of one ton of coal it had been found necessary to reduce goods and livestock trainloads by from 10 to 15 per cent. and speeds by 30 per cent. when firewood was used instead of coal or oil; many more wagons were needed for the distribution of firewood than when coal was used. Today the fuel distribution accounted for 16 per cent. of the total useful ton-kilometres effected by the steam services. Since fuels of local origin now had to be used a special fuel section had been formed involving the employment of at least 50 additional clerks.

On the electrification side, compared with steam passenger trains, a very much smaller amount of fuel was needed per gross ton-kilometre. By reducing the schedule speed by 8 per cent. a saving of 12 per cent. in the energy used and therefore the fuel consumed had been effected. Other operational steps taken to secure economies included a reduction to the minimum of the proportion of motor to trailer coaches in the train formation, and intensified avoidance of empty coach kilometrage.

Major O. Loewenthal, M.Inst.T., General Manager, Buenos Ayres Great Southern and Buenos Ayres Western Railways

At the outset Major Loewenthal quoted the following statement made by the Chairman, Mr. J. M. Eddy, at the annual meeting of the B.A.G.S.R. in November last:—

"The problem of obtaining fuel is becoming more and more acute. Supplies of coal and oil fall far short of our requirements, and we are now obliged to burn some 80,000 tons of wood a month. Very little wood is available in our zone, and the necessity of transporting it from the north of the republic greatly adds to its cost."

Of the Western Mr. Eddy had remarked that it had suffered less than others, because of its local section being electrified.

Continuing, Major Loewenthal said that so far neither electric current nor diesel oil had been in short supply and relative to steam fuel, the price of which had risen since September, 1939, by 266 per cent., their prices had risen only 48 per cent. and 42 per cent., respectively. Of the traction work on the Western Railway 52 per cent. was performed by steam, 39 per cent. by electric power, and 9 per cent. by diesel-electric railcars and shunting units. As the Western had 48 per cent. of its services covered by types of traction which were for the moment more or less care-free, and as, relatively, it was fairly favourably situated geographically as to sources of wood fuel supplies, and as its steam services were roughly only one-third those of the Southern, its difficulties, though alike in kind, were less in degree. He would limit, therefore, his remarks to the Southern.

Before the outbreak of war, 84 per cent. of the total revenue and non-revenue transport work of the Southern was performed by steam. The balance of 16 per cent. was done by diesel-electric locomotives, train-sets, and railcars, and a few petrol-driven Wickham cars. Up to the outbreak of the 1914-19 war, the Southern was, practically, 100 per cent. coal-fuelled. In 1916 Government permission was sought to convert a dozen local passenger engines to oil burning. Subsequently, for steam services the use of oil steadily increased to the degree that at the outbreak of the present war the consumption basis was 25 per cent. coal and 75 per cent. fuel oil. At present the company's actual Government-rationed oil quota was about 40 per cent. of pre-war consumption, and it was receiving a mere 20 per cent. of its pre-war coal requirements. This necessitated obtaining locally the equivalent of about 28,500 tons of coal a month.

The problem hinged on two facts: first, that the Southern had to depend for two-thirds of its requirements on wood fuel, 4 tons of which had to be made to produce the heat energy equivalent of one ton of fuel oil; and secondly, that for some months past it had obtained only three-quarters of the wood needed.

As an example of the innumerable handling and traction operations which the use of wood fuel entailed, Major Loewenthal quoted the case of an 11B type of engine, having a tender capacity of 9·2 tons of fuel oil with which it could haul a fully-loaded goods train at a speed of some 29 k.p.h. for 300 km. without refuelling. The same engine converted for wood burning could take 18 cu. metres—equivalent to 11 tons of "quebracho" and 7 of "calden." The 7 tons of calden would, under average conditions, take the train about 100 km. at a speed of about 25 k.p.h. As the pre-war running sheds were spaced about 160 km. apart, allowances had had to be made for abnormal conditions or extra shunting, making it necessary to have refuelling depots spaced every 70 km.

About 530 coal and petroleum engines on the Southern had to be converted to wood burning and fitted with rotary spark arresters at an average cost per unit converted of $900. As wood-burning engines required wood-passers, the footplate staff had had to be increased by 13 per cent. Despite reductions in the haulage ratings of locomotives, the average running speeds of goods and livestock trains had dropped by about 4 k.p.h., whereas the need for refuelling *en route* had sent up the average delays in stations by about 3 min. Also, the boiler tubes and ash-pans of wood-burning engines demanded more frequent attention. The cumulative effect of this impairment of efficiency was to reduce by 17 per cent. the km. run per engine prepared. To counteract this reduced locomotive availability, running shed staff had had to be augmented by 6 per cent. in order to cope with a 14 per cent. increase in the nnmber of engines prepared.

Passenger services had suffered a 40 per cent. cut in main-line kilometrage, and 16 per cent. suburban, with a ban on all excursion trains.

The Southern Railway, as the biggest livestock carrier in the republic, had been obliged to give this traffic the preference which its nature always demanded. The goods traffic was the principal victim of the fuel situation. Article No. 45 of the National Railway Law established, practically, an indiscriminate *laissez-faire* despatch of all types of goods from every station. The combination, therefore, of a plethora of traffic with a weakened traction potential was tantamount to forcing the railway to bite off more than it could chew. The resultant indigestion took the shape of congested yards and terminals, excessive occupation of block sections, delays for crossings of all types of trains, increased light engine mileage, stalled trains, and finally a slower turnround of rolling stock which imposed a lag in supplying wagon requisitions. It was worse than a vicious circle. It was a helical spiral.

PAPER ECONOMY IN THE ARMY.—Lectures, films, economy inspections, and the establishment of economy-training centres have helped to increase the efficiency of salvage collections to reduce paper consumption, and encourage the re-use of material in the Army. Seventy-five per cent. of all Army forms have been cut down in size, and further reductions are being considered constantly by a special committee. The abolition of one form alone has resulted in the saving of sheets of paper equal in number to two-thirds of the Army's total strength.

Cylinder Wear

Some factors influencing the life of locomotive cylinder castings

THE vital and complicated casting comprising the cylinders and valves has been called the "soul" of the locomotive; certainly it is the meeting point of so many design features that it is called on to shoulder a most formidable number of characteristics, each contributing in its own way towards the final result in the performance of the engine. No other components, except the boiler and smokebox, have so profound an effect on the general results of the machine in service.

Even the comparatively high cost of cylinder castings has had its effect on design, for until William Stroudley gave a lead to the railway world, it was customary to cast each cylinder (with its accompanying valve chest) separately, and to bolt the two portions together in the erection of a two-cylinder engine. The argument for separate, as against combined, cylinder castings was, of course, that if any chance damage occurred, for example, the fracture of a stuffing box, only half the assembly would need renewal. The old fashion of separate castings, especially for outside cylinders, died hard; and it was not until the former North Eastern Railway adopted generally the principle of three-cylinder high-pressure propulsion that the "monobloc" casting comprising all three cylinders with their accompanying valve chests, became accepted practice. One still recalls the strictures levelled against this innovation—criticism of a type which virtualy duplicated that directed against Stroudley's practice a generation earlier.

In the cylinder casting we have to consider influences due to a variety of causes: metallurgical, because of the nature of the casting; mechanical, because of the effect of the steam distribution; and thermal, because of the effect of steam conditions, both on power output and on lubrication.

A cylinder and piston may be regarded as a special form of reciprocating bearing, wear occurring between the outer surfaces of the rings and the bore of the casting itself. The wear is usually greatest towards the ends of the barrel; and in this connection it must be remembered that the total wear is not necessarily a direct function of the number of miles run or the number of hours in steam. Nor is it a function of piston speed. In other words, the intensity of the service is no true measure of the rate of wear, which is often proportionately higher, for instance, on services involving numerous and comparatively lengthy stops than on many of the longer-distance express runs.

Reasons for these apparent anomalies centre on the vital principle that, for minimum wear, a satisfactory oil film must be maintained over the internal surface of the cylinder barrel during the whole of the operating period. It may as well be remarked, in passing, that cylinder lubrication worries were negligible before the advent of superheated steam, because the moisture carried in saturated steam generally was sufficient to provide a lubricating effect. With superheated steam, however, the moisture was removed in the superheater elements, and steam now arrives at the cylinders so hot that even an undue thickness of casting, permitting an undesirable increase of temperature at a sensitive spot, may be sufficient to harm the film of oil and promote excessive wear in its vicinity.

Failure to maintain the oil film is, in fact, the cause of most cylinder wear. If the oil is supplied to the cylinders of a superheated locomotive by a mechanical lubricator (as it is usually), no oil delivery takes place while the engine is standing, so that a long stop (such as is common on freight workings) may give sufficient time for the oil film to lapse. Immediately direct contact occurs between ring and cylinder casting, undue wear occurs.

It therefore appears that the point in the barrel at which the oil from the lubricator is introduced is a matter of great importance. Normal British practice objects to branches in oil delivery pipes, and favours a single central position in the bore, but it is interesting to observe that in many examples of Continental practice, particularly French, two inlets are provided, one at each end of the cylinder, so that lubrication is most effective towards the dead centres. The effect of this arrangement is to provide plenty of oil when the piston is almost stationary, and to ensure optimum lubrication over the region where maximum compression occurs.

As to the effect of piston rings on the life of cylinder castings, it is timely to recall the words of an authority, Mr. H. J. Young, who has made a special study of the subject:—

"That it is 'better to wear the ring than the cylinder and, therefore, to use soft rings' is a costly fallacy. The hardness or toughness of the ring should more than equal that of the wall; actually may be far greater without ill effect. When ring wear is troublesome on an otherwise normal superheated steam or internal-combustion engine, the above remedy [harder and tougher rings] reduces it and, certainly, does not increase bore wear."

Shortly before the present war some interesting experiments were being carried out on piston rings having a lower proportion of phosphorus than usual; also on rings containing nickel and chromium. Experiments with bronze rings were also made in America. About the same time a tendency towards a larger number of rings on the piston had become noticeable. In France, four rings were tried, and evidently proved satisfactory as the practice was widely adopted; in Germany as many as five rings were commonly used.

Two reasons suggest themselves for these tendencies: (1) the need for more effective means for keeping the plane of piston exactly normal to the barrel, despite any proneness to "whipping" in the rod; (2) wider distribution of the weight of the piston and reduction in leakage past the rings. Incidentally it would appear that a piston with several rings would have also a beneficial effect on the glands and stuffing boxes.

It must be admitted that in heavy high-speed express work piston-ring wear is still a serious factor. Piston rings in some cases may last 40,000 miles' running, as is claimed by one British railway, but in general their mileage is much less. The explanation may be in the fact that if the service is sufficiently exacting, the running temperature in the cylinder may reach a level at which the well-known "glazed" surface of the barrel begins to break down. Once this break-down has been started both piston ring and cylinder wear will be rapid.

With improvements in anti-carbonising devices, and with the application of air valves to the steam chests, cylinder wear due to abrasion has been minimised. Formerly, particles of dust and grit were drawn through the blast pipe into the valves and cylinder ports when the engine was coasting, bringing the twin evils of "carbonisation" (largely a misnomer) and excessive wear. The practice of allowing a "breath" of steam to enter the cylinders, while coasting, has now been successfully tried as a means for removing these difficulties. The equivalent French practice is to inject water or steam into the exhaust passages to reduce the temperature of the gas when coasting, and so prevent carbonisation.

FORTY MILLION ENVELOPES SAVED.—By the use of war-economy labels on official envelopes, the Post Office has cut its envelope requirements by more than forty million.

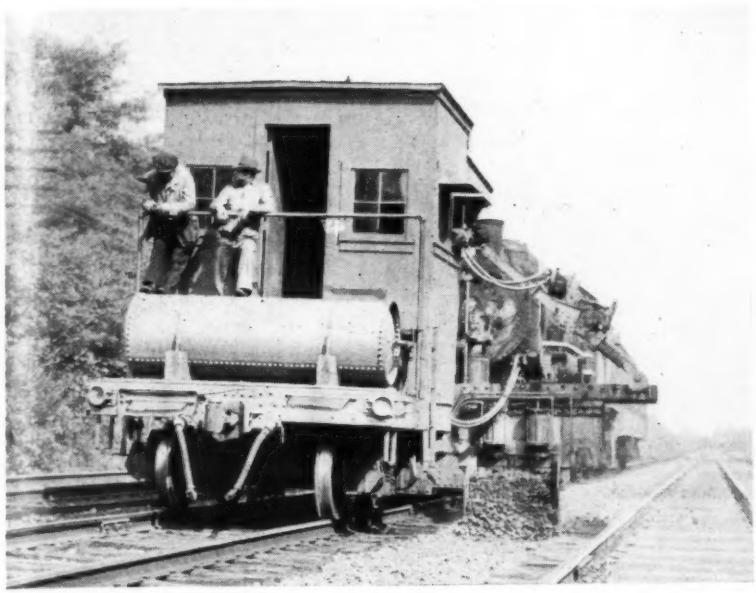
ROAD TUNNEL IN ISTANBUL.—The Istanbul municipality recently decided to build a road tunnel in connection with a street which is to connect the Istanbul main railway station with the historic town walls that have existed from the Byzantine period. Expenditure is estimated at £T.22,000,000. This is part of an extensive improvement programme to be completed by 1953, when elaborate celebrations are to mark the fifth centenary of the conquest of Istanbul by the Turks.

A.C. AND D.C. WELDING.—The Directorate of Industrial Electrical Equipment, Machine Tool Control, announces that, as some misunderstanding appears to arise in connection with the hazards of a.c., as distinct from d.c. welding, the following points should be borne in mind: (1) whether a.c. or d.c. is used, "live" equipment is concerned; (2) the potential danger from faulty insulation is rather greater with a.c. than with d.c. welding circuits. Modern high-speed a.c. welding technique calls for an open circuit voltage of 100. Protective measures have been provided for in British Standard No. 1071, 1943; (3) although the normal open circuit pressure of 100 V is less than half the voltage normal for domestic appliances, unless proper earthing arrangements are made it is possible for large masses of steel work to become "live" in shipbuilding; efficient earthing arrangements are laid down in B.S. 1071, 1943.

HIGH-TENSILE STRUCTURAL STEEL.—In connection with Amendment No. 1 to British Standard 968-1941, issued last August, the research work of the R.11 Sub-Committee of the Welding Research Council of the Institute of Welding has shown that the higher the hardenability of an alloy steel, the poorer is its weldability. Hardenability is increased chiefly by carbon, and, if good weldability is to be ensured, the amount of carbon should be limited to 0·23 per cent. The revision contained in the amendment allows alternative compositions to be used. The first is a carbon-manganese steel containing relatively small quantities of residual chromium (up to 0·35 per cent.) and up to 1·8 per cent. manganese; and the second one containing up to 0·8 per cent. chromium with the manganese limited to 0·8 per cent. In both cases the upper limit of carbon remains at 0·23 per cent., and, since quantities of alloy-steel scrap are being used at the present time, the limit of residual nickel is 0·5 per cent.

Mechanical Ballast Dressing

A description of the plant in use on the Erie Railroad, U.S.A.



A PIONEER in the use of mechanical ballast dressing is the Erie Railroad, which has gradually developed and perfected this labour-saving device in recent years. The ballast-dressing unit is, in each case, a 40-ft. steel flat car fitted with shaper blades, one at each side, so as to give the correct ballast profile. That on the left shapes the ballast suitably for the "six-foot" way, and the one on the right for the shoulder ballast. Each is capable of a variety of adjustments actuated by compressed air and controlled from a cab at the forward end of the car. The blades are highly flexible and can be adapted to any track conditions; each is controlled and acts independently of the other. One full-time operator is employed, who obtains assistance, if necessary, from a track foreman or other employee familiar with the working of the car, which is pushed by a locomotive at about 3 m.p.h.

The blade on the six-foot side consists essentially of a $\frac{7}{8}$-in.-steel plate hung from an arm or outrigger, hinged so that it can project at right-angles to the track when in operation, or fold back against the side of the car when not in use. The main plate is 3 ft. wide and has its lower corners chamfered off to a width of 12 in. on each side at an angle of $1\frac{3}{4}$ to 1, the slope of the ballast of both tracks in the six-foot way on the straight. When in use on straight track this plate, working centrally to the two roads, removes the ballast to a depth of about 8 in. and leaves a $1\frac{3}{4}$ to 1 slope on each side. Its lower edges are reinforced by wearing plates riveted to them to counteract abrasion. To enable it to carry forward the ballast and prevent the latter being thrown over the sleepers, it is provided with a hinged wing plate at each side; these wing plates are 2 ft. 6 in. wide, and the whole forms a box-like scoop. The angle between the blade and wing plates can be varied, but is normally 90 deg.

For working on curves, where the ballast section varies from that on the straight, the shape of the lower edge of the blade plate is varied, by the lowering of an adjustable steel shoe at each truncated corner of the blade when a curve is reached. These shoes in their lowest position, are in line with the horizontal edge of the blade plate, thus forming a straight edge the full width of the blade. Adjustment of wings and shoes is by compressed air, with which also the telescopic hinged struts keeping the outrigger in transverse position, and raising or lowering it about a horizontal axis, are worked. This latter adjustment is necessary so as to vary the transverse slope of the blade for use on curves, where the ballast section, instead of being in the form of an 8-in. depression between the tracks, consists of a slope connecting the ballast lines of the tracks. The blade can, in addition, be moved inwards or outwards along the outrigger to suit varying track centring. Moreover, the outrigger and blade can be raised bodily to clear level crossings, crossovers, and other obstructions, the range of movement being 2 ft. 8 in.; all these adjustments are by compressed air.

The shaper for the outside ballast slope is completely different, except that it is also on an outrigger of sorts. The shaping of the ballast is effected by a flat steel plate 3 ft. 6 in. long—measured *parallel* with the track—which lies flat against the ballast slope at the desired angle, and with considerable weight behind it. As the car moves forward, it presses firmly on to the ballast, thus both shaping and compacting it securely in position.

At its forward end this blade plate has

Outside ballast slope of double track dressing before passage of the ballast dressing car

Same ballast after ballast dressing car has passed over, compacted, and tidied it up

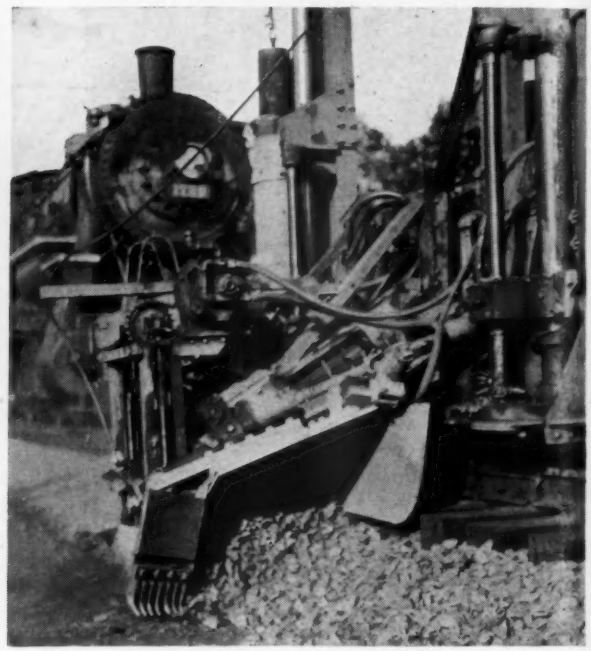
an extension which flares upwards, and to both edges of this extension are fixed flat steel plates so as to form the sides of a box-like recess. This recess serves to retain any ballast accumulated in front of the plate until it is deposited at a point where there is a deficiency. To the lower side of this recess is attached a toothed member flared out from the ballast toe line in such a manner as to collect loose pieces and return them to the slope. An 8-in. wide 1-in.-steel plate, projecting 3 in. below the lower edge of the shaper plate, is forced by the weight of the shaper plate and outrigger into the formation to form a well-defined toe line.

The outrigger is hinged on a horizontal shaft along the side of the car, and can be lifted by a cable and hoist in an arc about this shaft. The whole assembly, including shaper, outrigger, and shaft, is mounted on two vertical guides or posts, up which it can be moved by means of vertical screws at the guides, worked by gearing from a compressed air motor. In this instance also, a number of adjustments of the shaper are necessary to suit varying dimensions and inclinations of the shoulder ballast on curves. The width of the blade can be varied telescopically by rack and pinion gearing.

The angle of inclination of the blade can also be adjusted by screw gearing, and as the width of the ballast shoulder varies from 12 in. beyond the sleeper ends on the outsides of curves, to 6 in. elsewhere, an adjustment to meet this condition is also provided. All these operations are actuated by compressed air, provided by an air pump on the car with assistance from air from the train pipe. The pressure maintained is from 90 to 120 lb. per sq. in., storage being in a large cylinder. A set of control levers for each outrigger is provided at the side of the cab nearest to it, and ample windows enable the operator to watch the work.

The Erie ballast shapers have been developed under the general direction of Mr. J. C. Patterson, Chief Engineer Maintenance of Way, and under the direct supervision of Mr. E. H. Ness, Supervisor of Work Equipment & Welding, states our American contemporary *Railway Engineering & Maintenance*, to whom we are indebted for the illustrations.

"Six-foot" dresser carrying forward surplus ballast between the two wings on the blade, etc.



Outside shaper at work, with flared toothed member ready to collect straying ballast

Members of the Forces assisted the railways recently in dealing with the Christmas and New Year accumulation of parcels traffic. The illustration shows soldiers at a London main-line terminus

Photo] *[The Daily Express*

RAILWAY NEWS SECTION

PERSONAL

Mr. FitzHerbert Wright has been appointed a Director of the London & North Eastern Railway Company, to fill the vacancy on the board created by the resignation of Lord Burghley, who recently was appointed Governor & Commander-in-Chief of Bermuda. Mr. Wright is a Director of the Butterley Co. Ltd.

INDIAN RAILWAY GENERAL MANAGERS

Mr. G. E. Cuffe, General Manager, Great Indian Peninsula Railway, has been appointed General Manager, Bengal & Assam Railway, in place of Mr. L. P. Misra, who has been appointed to the Railway Board.

Lt.-Colonel R. B. Emerson, Royal Engineers, who has been on military duty, and who had officiated as General Manager in 1939, has been appointed General Manager, Great Indian Peninsular Railway.

Mr. J. M. Eddy, Chairman of the Buenos Ayres Great Southern Railway Co. Ltd. and the Buenos Ayres Western Railway Limited, who receives the honour of Knighthood in the New Year list, is paying a short visit to Brazil. He flew to Rio de Janeiro from Buenos Aires, where, as already recorded in our columns, he is engaged in a joint study with the Argentine Government of the position of the British-owned railways.

We regret to record the death on January 4, at the age of 57, of Mr. George Ridley, M.P., Chairman of the Labour Party, and Editor of the *Railway Service Journal*. He was a member of the Executive Committee of the Railway Clerks' Association from 1909 to 1920, except while serving in the Army during the period 1915-19. In 1920 he was appointed to the permanent secretarial staff, and held the position of Assistant Secretary until his death.

Mr. W. A. Dobson, Acting Permanent Way Engineer (Railways), London Passenger Transport Board, is resigning that position, and is taking up an appointment with Guest, Keen & Nettlefolds Limited and associated companies as Technical & Commercial Representative.

Brigadier (Temporary) Sir Godfrey D. Rhodes, C.B., C.B.E., D.S.O., receives Mention in *The London Gazette* of December 23, 1943, in recognition of distinguished services in Persia and Iraq. He was formerly General Manager of the Kenya & Uganda Railways & Harbours, and was appointed Director of Transport, Persia, in 1941.

The following awards were announced in a recent list of honours conferred in the Middle East :—

Brigadier Sir Frederick Carson, M.C., formerly General Manager, North Western Railway, India, and subsequently Director of Transportation, Iraq, to be a Commander of the Order of the British Empire.

Brigadier K. N. Simner, also an engineer officer of the North Western Railway, while Director of Railways, Middle East Force, to be an Officer of the Order of the British Empire.

Both are former regular officers of the Royal Engineers, who were employed permanently on Indian State Railways.

Mr. Dennis Hodsdon Handover, M.Inst.T., who, as recorded in our December 31 issue, has been appointed by the four main-line railway companies as their Air Adviser, has been connected with British commercial aviation from its earliest days. He was born in 1896 and was educated at Haberdashers'; he had intended training as an electrical engineer, but the war intervened, and he volunteered as a dispatch rider, R.N.A.S. (Armoured Cars). He took part in the first landing at the Dardanelles, and served in Egypt, before being invalided in 1915. On recovery, he was commissioned as Assistant Paymaster, R.N.V.R., and later was promoted Paymaster-Lieutenant. He served until demobilisation in 1920, when he was the senior R.N.V.R. staff officer in the Nore Command. He then joined the Aviation Department of S. Instone & Co. Ltd., and became Commercial Manager. He served for four years as Manager at Cologne for Instone Air Lines, and later became Traffic Superintendent, and afterwards Traffic Manager, Imperial Airways Limited. His duties in that position for some years included operations, until a separate department became justified. After the undertaking of Imperial Airways Limited had been acquired in 1940 by the British Overseas Airways Corporation, he became Traffic Director of the latter, which position he relinquished on December 31 last. Mr. Handover was for many years, until the outbreak of the present war suspended that work, senior British representative at the conference of the International Air Traffic Association. He was also Chairman of the Traffic Commission, and was a member of the Air Mail and Combined Transport Committees, of that Association. (*See editorial article, page* 33.)

Mr. D. H. Handover

Appointed Air Adviser to the four British main-line railway companies

We regret to record the death on December 24, at the age of 63, of Mr. John Mitchell Walker, General Agent for Scotland, Canadian National Railways. He was born in Glasgow, and gained his early shipping experience with the old Allan Line, which he left to join the Grand Trunk Railway, in 1907, with the appointment of General Agent. On the amalgamation of the Grand Trunk and Canadian National Railways in 1921, Mr. Walker was appointed District Agent. In 1923 he became District Traffic Agent and in 1937 was promoted to be General Agent for Scotland.

Captain Ricardo Vago, Argentine Navy (retired), who last October succeeded Vice-Admiral Ismael Galindez as Minister of Public Works, Argentina, has resigned. Vice-Admiral Benito Sueyro, Minister of Marine, has been appointed temporarily as Minister of Public Works.

Mr. T. F. Brazil, Commercial Assistant, Great Southern Railways, has been elected Chairman of the Traffic Officers' Committee, Irish Railway Clearing House, for 1944.

The L.N.E.R. announces that Mr. George Dow, Information Agent, has been redesignated Press Relations Officer.

Mr. H. Gardner, Stationmaster, Grantham, L.N.E.R., who, as recorded in our January 7 issue, has been appointed Stationmaster, Marylebone, commenced his railway career on the former Great Northern Railway at Dewsbury in 1906, and became Stationmaster at Hare Park in 1920. He was subsequently Stationmaster at Ingrow, Lofthouse, and Woodford & Hinton. In 1936 he was appointed Yardmaster at Sheffield, and in June of the next year went to Lincoln as Stationmaster. Mr. Gardner was appointed Stationmaster at Grantham in April, 1938.

Mr. F. E. Bailey, Assistant (Claims), Chief Commercial Manager's Office, Watford, H.Q., L.M.S.R., who, as recorded in our January 7 issue, has been appointed District Passenger Manager, Manchester, was educated at Sir John Deane's School (A.D. 1557), Cheshire, and entered the service of the former Lancashire & Yorkshire Railway in 1910. He served in various departments of the District Superintendent's Office at Manchester and in

the Goods Department at Trafford Park and Manchester Docks. He joined the Army shortly after the outbreak of war, and was granted a Special Reserve commission in the 3rd Battalion, Manchester Regiment; he served in France with the 19th (4th City Pals) Battalion. In 1918 he was appointed to duty with the Royal Engineers, Docks Directorate, and served at Calais, Rouen, Cologne, and Rotterdam; at the last-named in 1919 he was responsible for demobilisation arrangements and for food shipments into Germany *via* the Rhine. On resuming railway duties in 1920, he was engaged at Manchester Docks on the Ministry of Transport scheme for relieving congestion there, and later was appointed Commercial Representative covering the Trafford Park area and shipping concerns in Manchester. He was appointed Goods Agent, Manchester Docks & Trafford Park, in 1929, and Chief Canvasser, Manchester District, in 1932. Two years later he was made Assistant to District Manager, Bolton, and has also been Assistant to the London District Goods Manager, as well as Acting District Passenger Manager, Euston, in 1941, in the absence of Colonel H. E. Roberts, abroad on special Government service. After completing a special inquiry into the commercial liaison arrangements in the London District, he was appointed in 1936, Sales Assistant to the Chief Commercial Manager at Euston, and on the opening of the L.M.S.R. School of Transport at Derby he was appointed a Member of the School Council, and also Lecturer on "Railway Salesmanship." Mr. Bailey was appointed Assistant (Claims), Chief Commercial Manager's Department, early in 1942.

Mr. F. E. Bailey

Appointed District Passenger Manager, Manchester, L.M.S.R.

Mr. D. O. Beaton, who, as recorded in our December 17 issue, has been appointed Passenger Agent, Liverpool, Canadian Pacific Railway, as from January 1, has been in the company's service since 1920. He has had considerable experience in the world and other luxury and popular cruise services of the C.P.R., and was appointed in 1937 as Special Representative of the company's Cruise Department. In 1941 he was made Passenger Agent, London City Offices, C.P.R., and in August, 1942, Special Representative, European Passenger Department, at the company's Head Offices, Trafalgar Square, from which position he takes up his new appointment.

We regret to record the death on January 1, at the age of 72, of Mr. Alfred Hood Lingard, who retired in 1936 from the position of Commercial Assistant to the Traffic Manager, Southern Railway. Mr. Lingard entered the service of the former London Chatham & Dover Railway in 1887, as a junior clerk in the Goods Manager's Office. After obtaining a knowledge of the work of various sections in that department, he was appointed Assistant Rates Clerk in 1891. In 1900, on the working union of the London Chatham & Dover and South Eastern Railways, he was responsible for the preparation of the complete list of goods rates between the two sections. He was appointed Chief Rates Clerk in 1911, which post he held until promoted to the position of Assistant to the Goods Manager in 1920. During 1923 he acted as Chairman of the Railway Clearing House meetings of goods and mineral managers' representatives in connection with the revision of rates and other questions affecting the Goods Department, and at the end of that year he was appointed Assistant for Rates & Fares. In 1930 he was promoted to be Deputy Commercial Assistant, and in November, 1934, he was appointed Commercial Assistant to the Traffic Manager.

The late Mr. A. H. Lingard

Commercial Assistant to the Traffic Manager, Southern Railway, 1934-36

Mr. P. C. Sharp, Secretary, and Mr. A. P. Quarrell, London Office Manager, have been appointed to the board of Petters Limited, which is a subsidiary of the Brush Electrical Engineering Co. Ltd. Mr. Sharp joined the staff of Petters Limited at Yeovil in 1928, and was appointed Secretary in 1934. After the fusion of the interests of the company with those of the Brush Electrical Engineering Co. Ltd., he became Secretary of the latter and its subsidiaries. Mr. Quarrell joined the staff of Petters Limited in 1924, and was appointed London Manager in 1937; his responsibilities were increased considerably when the London organisations of the Brush Electrical Engineering Co. Ltd. and Petters Limited were merged in 1939.

Mr. J. B. Helsby, a founder and Managing Director of the Topical Press Agency Limited, whose death was announced in our December 31 issue, was well known in railway circles, and on many occasions had attended railway functions in the course of his professional activities, for his own business interests, and also on behalf of the railway companies. His connection with railway photography had been outstanding for over 40 years, and he enjoyed a wide acquaintance with railway people. He was present at numerous functions in connection with the opening of new works or the popularising of new facilities. Many of the illustrations in connection with the functions, and of groups of railway personalities, which have appeared in our pages, have been made from his negatives. Although not apparently of robust constitution, and obliged to walk with a stick on account of a foot deformity, he never shirked any task, scaling ladders and, with all his photographic impedimenta, reaching positions aloft which often deterred others of better physique. He was at his office in Fleet Street within about four days of his death, and died in his 82nd year.

The late Mr. J. B. Helsby

A founder and Managing Director of the Topical Press Agency Limited

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We regret to record the death on January 6, in his 77th year, of Mr. Charles John Lee, who, as an accountant, was employed on pre-grouping railway company audits with Messrs. W. B. Peat & Company, including such audits as the South Eastern Railway Company and also the Railway Convalescent Homes. His son, Mr. Charles E. Lee, is an Associate Editor of *The Railway Gazette*.

Sir Francis Joseph has been elected President of the Institute of Industrial Administration, in succession to Lord Davidson. Sir Francis Joseph is a Director of the London Midland & Scottish Railway Company.

Mr. W. O. J. Urry, Secretary to Heenan & Froude Limited, has been elected a Director of that company's subsidiaries, Fielding & Platt Limited and Court Works Limited.

TRANSPORT SERVICES AND THE WAR—224

Meikel Earnock Halt Closed

Meikle Earnock Halt on the High Blantyre to Strathaven branch of the L.M.S.R. (near Hamilton, Lanarkshire) was closed for the duration of the war as from the evening of Saturday, December 11, 1943.

Part-Time Help

G.W.R. girl porters, vanguards, and clerks are helping their men colleagues clear 25,000 wagons of war freight every weekend by working on Saturday afternoons and all day Sundays. Thousands of traders are co-operating with the railway by taking delivery of goods outside ordinary business hours.

Raids on Great Britain.

Air raid casualties in this country amounted to 2,347 killed and 3,421 seriously injured in the first eleven months of 1943, compared with 3,112 killed and 3,948 seriously injured in the same period in 1942. Raids were on a small scale and of little military consequence, but they proved a railway nuisance in various areas. " Sneak raids," or attacks on coastal areas by fast fighter bombers coming in at zero height in an effort to elude the defences, were the main feature of the year's raiding.

The L.M.S.R. War Effort

On Thursday, December 30, 1943, L.M.S.R. ran its 100,000th special train since the outbreak of war. This total included 52,603 troop trains, 25,288 stores trains, 6,799 trains of ammunition, and 15,310 petrol trains. It represents the movement of 15 million personnel, one million wagons of freight, and nearly half a million tanks of petrol.

The mileage involved in working the troop trains was 6,575,375, and for the freight trains 4,265,730, a total of 10,841,105 miles.

Record G.W.R. War Traffic

In 1943 the G.W.R. broke its own record of war carryings for the Government, running nearly 19,000 special troop and armaments trains in addition to the vast daily transport of H.M. Forces and materials by ordinary services. The G.W.R. had to find more than 30,000 carriages for troop trains alone, while guns, tanks, explosives, vehicles, and stores used nearly 490,000 wagons, or 200,000 more than in the previous year. Train working on this huge scale requires nearly 1,100 more goods train guards than the company had before the war.

London Buses in 1943

During the year 1943 the London Passenger Transport Board placed 74 producer-gas buses in service; introduced 29 wartime " utility " buses; began to use 25 trolleybuses built for service in Durban, and 18 built for Johannesburg; reduced the running time on 155 bus routes; and erected 258 roadside passenger shelters. Parking schemes for buses and trolleybuses resulted in a saving of 2,260,000 miles, with substantial economies in rubber and fuel. The curfew on 178 routes, since last May, saved 900,000 miles. Some 823,000 special 1s. tickets, giving unlimited travel for a day, were supplied to members of H.M. and Allied Forces on leave.

Transport Curfew in South Africa

A Government Order imposing uniform public passenger road transport restrictions throughout the Union of South Africa and South West Africa, with effect from October 31 last, has been gazetted as an Emergency Regulation. The Order applies to vehicles seating more than eight passengers each and travelling for public conveyance along fixed routes; and requires that all such vehicles shall begin their latest outward journeys not later than 10 p.m. on weekdays or 9 p.m. on Sundays. Provision is made for granting exemption in special cases. The road motor services operated by the Railways & Harbours Administration are included in the terms of the Order.

The Western Desert Railway

Some recent information has come to hand regarding the working of the Western Desert Railway, between Alexandria and Tobruk. It may be recalled that, with our victorious advance into Libya, the whole railway came into Allied hands with the re-occupation of Tobruk, on November 13, 1942. As we recorded in the illustrated article in our issue of February 5, 1943, pages 139-144, by a remarkable piece of railway reconstruction work on the part of the Allied Forces—mainly South African railway construction troops—mines laid along the track by the retreating enemy were removed by sappers, and the German damage made good, within 7 days. The line to Capuzzo (captured on November 12, 1942), was being used by November 19, and the remainder to Tobruk railhead on November 20. Much of the line consists of flat-bottom rails spiked direct to the sleepers, but there are also sections of chaired bull-head rail. The Allied Forces completed the section between Tobruk railhead and Tobruk Harbour, a distance of 18 miles, which had been surveyed by the Germans. This brought the total length of the railway up to 423 miles, made up of 176 miles from Gabbary (Alexandria), the zero point, to Similla Junction; 229 miles thence to Tobruk railhead; and the 18 miles on to the Harbour.

On the resumption of services, diesel operation was introduced on the Western Desert section, and steam confined to the Egyptian State Railways line, though previously steam had operated eastward from Fort Capuzzo. On January 4, 1943, a regular military passenger service to the Delta was begun, and by August last the journey was taking about 21 hours net, which was very creditable. The diesel locomotives employed are of the double-bogie type, and are American built; they generally work in pairs. This type is also operating in Egypt and Syria. W.D. Stanier 2-8-0s have always had a monopoly of the steam workings, although they are not in evidence in such large numbers nowadays as formerly.

Capt. P. J. Bawcutt, who is serving with the M.E.F., informs us that on one journey up the desert a 2-8-0 hauling 13 Egyptian State Railway coaches of about 510 tons gross did very well indeed, often attaining speeds in the region of 55 m.p.h. The maintenance of the engine was not of the best, however, and the native driver and fireman took advantage of the stop at El Daba to insert a bar inside the top of the blastpipe—a procedure in which they appeared to be well drilled. This was no doubt in preparation for the ensuing climb up the Fuka escarpment, which was negotiated most successfully.

Some W.D. 2-8-2s appeared for a short time at the end of 1942. Egyptian State Railway Moguls also took a hand. The enemy had used large four-coupled diesel locomotives, supplemented by heavy lorries converted for rail use. L.M.S.R. diesel locomotives have also been used in the past on shunting duties. Rolling stock has been supplied chiefly by the Egyptian State Railways, supplemented by various W.D. types, including four-wheel 25-ton brakevans with end platforms of the Southern Railway pattern. Interesting features in the past have been anti-aircraft wagons, and Stanier 2-8-0s with walls of steel or concrete on the running boards for boiler protection.

French Railway Fare Increases

Railway fares in France were increased by 25 per cent. from Monday last, January 10, according to an official German announcement.

Roumanian Travel Ban

A ban on civilian travel on all main railway lines in Roumania was imposed from Monday, January 10, according to the Budapest radio, to keep the railways free for military movements.

Road Vehicles on the Giurgiu-Russe Ferry

The conveyance of road motor vehicles across the Danube by the Giurgiu-Russe ferry was introduced recently. The rate for a lorry is Lei 1,000, and for a motorcar Lei 600. Construction of the rail and road bridge across the Danube at this point was scheduled to begin last October.

Bulgarian Train Cancellations

According to the Sofia radio of January 5, the whole of the Bulgarian railway system has been taken over by the German Military Command.

Several important Bulgarian trains were withdrawn on December 12. Restricted passenger traffic facilities will remain in force throughout the winter, according to a statement by the Bulgarian Minister of Transport.

Through rail traffic between Sofia and Skoplje, which involved transit of Serbian territory at Nish, has been cancelled. The journey may be made by a combined rail and bus schedule *via* Gueschevo. The railway to bridge the gap between Gueschevo and Kumanovo is being built as rapidly as possible.

American Seat Reservations

In order to ease the constant shortage of accommodation in long-distance trains, the U.S.A. Eastern Railroads Presidents' Conference laid it down on October 15 that no seat reservations in either Pullman cars or coaches could be accepted more than 30 days in advance of the seats being required. As a result of half of the entire Pullman pool of cars, and one-third of the coaches (the equivalent of third class stock) having been requisitioned for troop movements, and the thousands of men travelling on leave in ordinary trains, it is estimated that the average American car now carries four times its normal peacetime load of passengers.

Wartime Fares in New York City

On January 21, 1942, the New York Central System, with the Long Island Railroad and the Staten Island Rapid Transit Company, put into operation a 10 per cent. increase in passenger fares, other than season tickets, in the New York City area. This was in accordance with an Order from the Interstate Commerce Commission, but was contested by the Transit Commission of New York, which obtained a ruling from a lower Court deferring the increases. On October 14, however, the New York State Court of Appeals upheld the increase, on the basis that when, on February 10, 1942, the railways increased interstate fares into and out of New York,

in accordance with another I.C.C. Order, they were bound also to increase intra-state fares (*i.e.*, fares within individual state borders), as otherwise an unfair discrimination would be made against inter-state commerce.

Swedish Iron Ore Export

The conveyance of iron ore to Luleå (on the Gulf of Bothnia) had to be reduced as a result of a train accident on the Lapland Railway in September last which wrecked the line for a considerable distance. Repairs undertaken immediately enabled about 50 per cent. of the traffic to be restored by the middle of October, and full capacity to be regained some weeks later. The accident is said to have been caused by excessive wear to the line because of exceptionally heavy ore traffic.

Stalingrad Trams

The Moscow radio has announced that the tram service on 2 miles of line in Stalingrad was restored in the last week of 1943.

Moscow-Smolensk Rail Service

Direct passenger traffic by railway between Moscow and Smolensk has been resumed, according to the *Soviet Monitor* of January 4.

More U.S.S.R. Railway Developments

Recent reports indicate that double tracking has been completed on the Tashkent-Kandagash-Iletsk-Chkalov (formerly Orenburg)-Kinel-Kuibyshev line, a distance of 2,200 km. (1,367 miles).

The reconstruction of the line connecting Leninsk (opposite Stalingrad) with the Astrakhan-Saratov railway, as well as that linking Stalingrad with Saratov direct (*via* Kamyshin), has been finished, and both lines are said to be working. The length of the first is about 100 miles, and of the second approximately 200 miles.

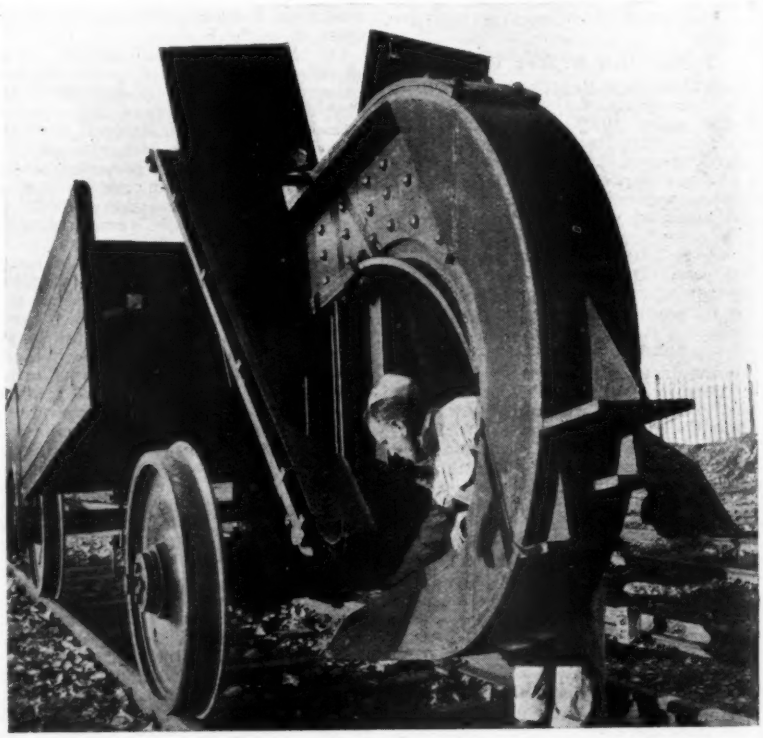
Estonian Rolling Stock Position

Now that the Russian advance is approaching many points on its 1939 frontier with Central Europe, particular interest attaches to any details which become available concerning the railway position in the territories which appear to be liable to Russian occupation in the near future. It may be recalled that the three Baltic states of Estonia, Latvia, and Lithuania decided on July 21, 1940, to become Soviet republics, and to join the Soviet Union. Their railways were afterwards incorporated in the U.S.S.R. Railways, but, since the occupation of these States by Germany in the latter part of 1941, the railways of the three countries are now separate units of the "Railways of the Ostland." Estonia and Latvia in 1939 were primarily 5-ft. gauge countries, and it does not appear that very large conversions of standard gauge in Lithuania to 5-ft. were effected during the recent Russian regime, nor do the Germans seem to have made the widespread conversions to standard gauge in Estonia and Latvia which they have in other parts of occupied territories, and it therefore seems likely that when the Russians re-occupy these parts they will find many of the lines, and some of the rolling stock, of their own gauge.

The havoc wrought in the rolling stock of the Estonian Railways through events of the war, requisition, etc., since September, 1939, is reported to have assumed enormous dimensions. Estonian rolling stock still left in Estonia and in serviceable condition is said to be at present only 30 per cent. of the 1939 total. Of the broad-gauge (5-ft.) rolling stock, only 55 per cent. of the locomotives, 25 per cent. of the wagons, and 5 per cent. of the coaching stock are stated to be available; and of the narrow-gauge (2-ft. 6-in.) stock, the proportions are 60 per cent. in respect of locomotives, 50 per cent. of wagons, and 30 per cent. of coaches.

Only 15 per cent. of the road motor lorries which were available in Estonia in 1939 are on the road, and only 5 per cent. of the fleet of inland water craft is in serviceable condition. At March 31, 1939, the Estonian broad-gauge railway rolling stock consisted of 103 locomotives, 300 carriages, and 3,474 goods wagons and vans; the narrow-gauge stock was 92 locomotives, 142 carriages, and 2,066 wagons and vans, and 6 railcars.

A Canadian official view of the railway through Carovilli after the passage of the track-wrecking machine which is being used by the retreating German forces in Italy. The machine is illustrated below



One of the German track-wrecking machines, stated to weigh about 10 tons, showing the large hook at the rear which rips up the sleepers as it is hauled along the lines, with results as shown in the top picture. Runways on each side are provided for dropping delayed-action charges, but these do not seem to have been used on the section of railway through Carovilli

The Belgian Frontier

As a result of the German occupation of Belgian and Luxembourg territory in 1940, the Germans decided to annex the whole of Luxembourg (as from August 30, 1942), and the districts of Eupen and Malmédy, in the extreme east of Belgium. In consequence, new frontier stations have been established on the railways crossing what the Germans now regard as the border between their own territory and Belgium. The accompanying sketch map indicates by shading the annexed territories, and the approximate line of the present frontier. In the north, it begins at a point on the frontier of Holland slightly to the east of Remersdaal, and that station is now regarded as the Belgian frontier station on the Visé line. Aubel occupies a similar position on the secondary line between Liége and Aachen, with Montzen as the German frontier for both railways.

On the main line between Liége and Aachen, Gileppe (Dolhain) is the Belgian frontier station for slow trains, but fast trains use Verviers (Central). Herbesthal is now the German frontier station, as it is regarded as being entirely in German territory. Before the 1940 invasion of Belgium, Herbesthal was the Belgian frontier station, and Aachen the German one, but the position before 1914 was substantially as it is now, and Germany has thus purported to reverse the decision of 1919.

Herbesthal is also the German frontier station for the Herbesthal-Eupen-Raeren line; heretofore, Raeren has been the Belgian frontier station.

Further south, the new German frontier cuts the railway near the small Belgian station of Meiz, but Masta is used as the Belgian frontier station, and Malmédy as the German.

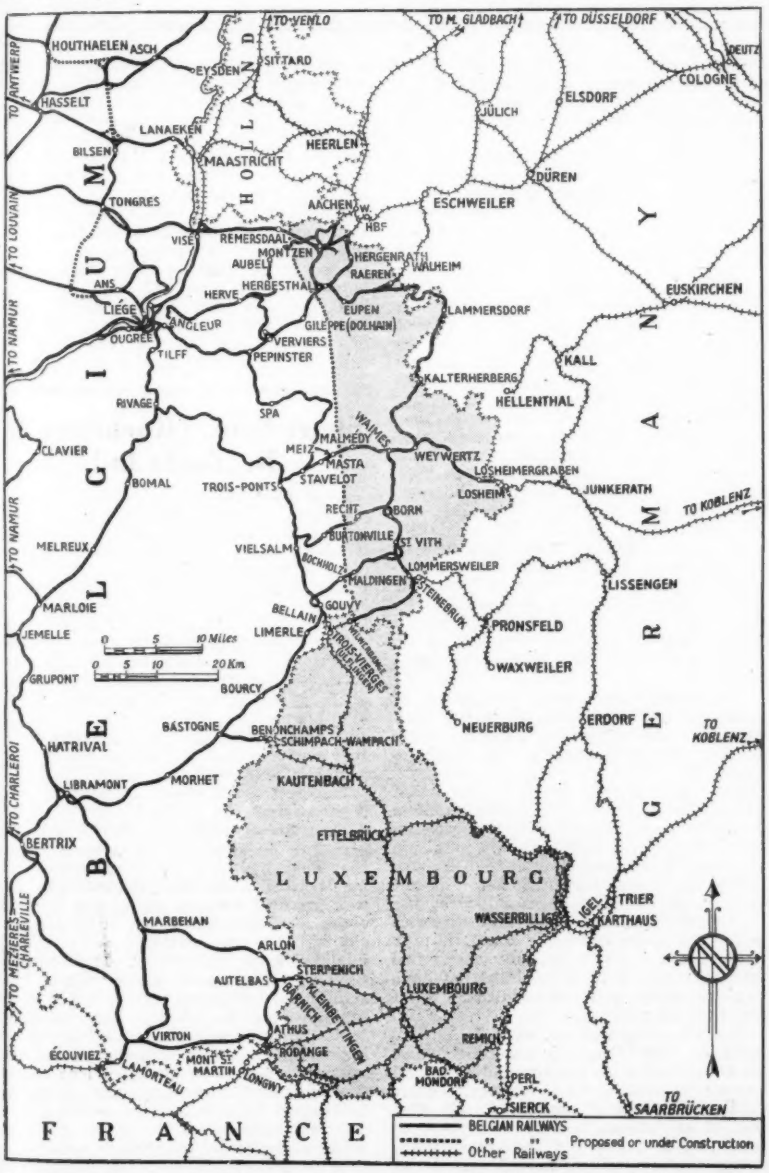
Still further south, the respective frontier stations are Burtonville and Recht; and then Bochholz and Maldingen, respectively. Incidentally, the Vielsalm-Born railway (on which Burtonville and Recht stations occur) is not now open for public traffic.

The former frontier between Luxembourg and Belgium is now regarded as the frontier between the Reich and Belgium. As a result, Gouvy is the Belgian frontier station and Trois-Vierges (Ulflingen) the German; between the two is Bellain, which the Germans call Besslingen.

Further south, on the Bastogne-Kautenbach link, the respective frontier stations are Benonchamps (Belgian) and Schimpach-Wampach (German).

Finally, there is a series of frontier crossings immediately to the west of Luxembourg. Arlon (called by the Germans Arel) is the Belgian frontier station, and Sterpenich, the German. In the early days of the occupation Kleinbettingen functioned as the German frontier station. Between Arlon and Sterpenich there are two stations (Weyler and Autelbas Junction), and Barnich Halt. Autelbas, called by the Germans Niederelter, is the junction for the line coming from Longwy (in France), and on this line Athus is the Belgian frontier station, and Mont St. Martin the French.

On the French main line to Luxembourg, Longwy is the French frontier station and Rodange (or Rodingen) the German.



The German frontier with Belgium and Luxembourg, showing (shaded) the territories annexed by the Reich, and the effect on railway frontier stations

The Indian Railway Conference Association

The forty-sixth session of Indian Railway Conference Association opened at Delhi on November 26, under the President, Mr. C. G. W. Cordon, C.I.E., E.D. (Agent & General Manager, Madras & Southern Mahratta Railway), and was attended by Sir Edward Benthall, Member, and Sir S. N. Roy, Secretary, War Transport Department; the Chief Commissioner, members, and the Financial Commissioner of the Railway Board; the agents and general managers of all railways in India; and some officers of the War Transport and Railway Departments.

Mr. Cordon, in the course of his address, referred to post-war reconstruction, and emphasised the importance in future of goods-traffic rating policy. Despite air, road, and water, railways would remain chief purveyors of transport; the problem was the control of all forms of communications, both as to services and charges. He explained the present system of charges, and added that, although conditions were abnormal, this complex and not widely-understood subject deserved consideration, so as to ensure a rating system suitable for the trade of the country after the war.

Sir Edward Benthall said that certain suggestions for alleviating the difficulties and discomforts of travel were being taken up vigorously, but it was not possible to forecast any material improvements until more passenger trains could be run. The locomotive and coal position at present prevented this, but steps were being taken to examine the possibility of affording some relief to long-suffering passengers by the provision of more bus services. in certain of the more congested areas, particularly where the war effort was in danger of being affected by difficulties in connection with essential travel. He announced that two operational experts, Mr. R. J. M. Inglis, Divisional General Manager, Scottish Area, London & North Eastern Railway, and Colonel J. A. Appleton, formerly General

Manager, New York Zone, Pennsylvania Railroad, who is now in the U.S.A. Army, had come to India to place their experience at the disposal of the Indian railways for a short time, and to see whether any British and American operational methods could be applied successfully to them. A hopeful feature of the present situation was the flow from overseas of metre-gauge and broad-gauge locomotives, which would help to an ever-increasing degree to provide that extra power needed for increased transport. Sir Edward added: "But we shall not put ourselves in the best position as regards power unless we have so reduced the percentage of locomotives under, and awaiting, repair that we can consciously say that the maximum efficiency in this respect has been reached."

Continuing, Sir Edward said that the railways in India had been fighting the war ever since the day it descended on them. The railwaymen's battles were not spectacular, but the less the railways were in the limelight the greater their success. In a long, continuous struggle such as they were engaged on, the limelight shone only on failures. There had been delays, perhaps avoidable, but few, if any, failures; and therefore, fortunately, little limelight. Nevertheless, among those who stopped to think, there was deep appreciation of the way in which their work had been done, and of the loyalty with which officers and men had devoted themselves to their task; the fact would give particular pleasure to railwaymen that the Central Advisory Council for Railways, composed of members of the Central Legislature, should have recorded at its last meeting a spontaneous and cordial appreciation of their work.

Speaking of increased war traffic, he said that, from April 1 to October 20, 1943, on Class I railways (except the Bikaner State and Mysore Railways), 627,000 tons more had been moved than in the corresponding period of the previous year, and that coaching traffic had increased by some 30 per cent. On the Bengal & Assam Railway, the latest returns of total earnings indicated that, helped by the concentration of rolling stock, traffic had increased as a whole by 78 per cent. To those who criticised the efficiency of Indian railways he commended a comparative study of efficiency statistics of British, U.S.A. and Indian figures. The battle was not over; for India, the time of maximum effort was still to come, and in the next few months further demands for transport would be made. For the moment, the shortage of coal might slow up temporarily industrial demands, and, if there was not rapid improvement in production, might even affect the running of railway services, as it had done in Australia. In those circumstances, it was scarcely necessary to emphasise the importance of fuel economy and the conservation of stocks from pilferage, matters which he knew had been engaging the attention of the railways for many years.

Arc Welding

Brief reference was made in our issue for November 19, 1943, to a film entitled "Resistance Welding"; this film, which is of great educational value, is available for loan to all approved organisations which make formal application to the Advisory Service on Welding, Ministry of Supply. It explains the technique of spot welding, butt welding, and flash-butt welding; arc welding, although of more general utility in heavy engineering, does not come within its scope. However, the potentialities of arc welding are well known; probably the most pressing problems arise out of the very wide choice of equipment available, selection from which for a particular purpose may be difficult in the absence of expert guidance.

This aspect of the subject has been covered comprehensively by Mr. H. F. Bibby, B.Sc. Tech., A.M.I.Mech.E., A.M.I.E.E., in *The Metropolitan-Vickers Gazette* for October, 1943. The first decision to be made is whether a.c. or d.c. equipment shall be acquired; even then the alternative presents itself of single or multi-operator apparatus. On the score of work done, that is, the quality of welds and the expenditure of energy and time in their production, there is little or nothing to choose between these respective alternatives; the matter has to be decided, therefore, by considering the relative costs and convenience of the different kinds of apparatus. Equipment for d.c. welding is in the form of a motor generator for supplying heavy d.c. currents at a relatively low voltage. The driving motor is usually of the 3-phase squirrel-cage variety, and the generator gives anything from 40 to 100 V. A d.c. arc usually can be struck with 80 V or less, and the current may be 300 A or even more. However, with currents in excess of 300A there is often some difficulty in controlling the arc on account of magnetic effects which cause it to move away from the seat of operations, particularly when this is in a corner.

In single-operator equipment the generator voltage characteristic is varied manually, but in multi-operator equipment the voltage is kept constant, and control is exercised by means of variable resistances, one of which is in each of the operators' leads. Resistance control is rather wasteful of energy, but on the other hand d.c. equipment gives a balanced load on the a.c. supply mains at a power factor of round about 0·8 The d.c. method is the only one suitable for welding aluminium, copper alloys, nickel, and certain alloy steels.

Equipment for a.c. welding consists of a special transformer which is wound for a secondary voltage going up to 100 or 110 V, and a condenser for power-factor improvement. The suppression of the arc twice in every cycle makes a rather higher voltage necessary with a.c. than with d.c. welding to ensure stability. With single-operator equipment the transformer voltage is variable at will, but with multi-operator equipment the transformer voltage is kept constant and variable chokes are inserted in each of the welding operators' leads. The choke method of control is less wasteful of energy than the resistance method necessary with d.c., but on the other hand it may bring the power factor down to as low as 0·35. If this be corrected fully by condensers a bad no-load condition will arise, for then a leading current will be taken, again at a very poor power factor. A compromise is usually effected; the condenser capacity is enough to bring the power factor up from 0·35 to 0·55 under the most unfavourable conditions; at other times it keeps the power factor up fairly near the more acceptable figure of 0·8.

The total current-output capacity of multi-operator equipment does not need to be as much as that for a corresponding number of single-operator sets; it is reduced in accordance with a diversity factor which allows for the intermittent demand of the several operators, only a few of whom usually will be welding simultaneously. Multi-operator sets are therefore lighter and cheaper than a number of single-operator ones, but it is not an economy to start one up for the use of a single operator as its no-load losses and upkeep are relatively large; if, over long periods, welding by only one or two men is required it is advisable to have single-operator sets in addition to a multi-operator one.

The advantages of a.c. over d.c. equipment are that (1) arcs in excess of 300 A are controlled more readily, as there is an absence of unidirectional magnetic effects tending to cause "arc-blow"; (2) first cost of equipment is only 50 to 70 per cent. of that for d.c. equipment; (3) energy consumption is halved and maintenance of the necessary static equipment is less than that for a rotating motor-generator set; (4) equipment is protected more easily out of doors against weather.

The advantages of d.c. over a.c. equipment are (1) suitability for non-ferrous and other special applications; (2) greater safety as only 60 V is needed when the necessary a.c. voltage would be 100 (corresponding to this r.m.s. valve the peak voltage is 141); (3) better average power factor and no unbalance of load on three-phase supply; (4) resistance controllers needed with multi-operator sets weigh only 80 lb. as compared with the much less portable a.c. chokes which weigh 350 lb.; and (5) interference between operators is less, so that sets can be designed for a larger number of operators.

Short Bros. (Rochester & Bedford) Ltd.

It is understood that a report on the progress of the reorganisation of Short Bros. Ltd. under the new management has been received by the Minister of Aircraft Production from the Industrial Panel appointed at his request by the Minister of Production and consisting of two industrialists and two trade unionists.

The report points out that the present management was brought in to administer an exceedingly complicated business, distributed throughout the country, whose affairs were in a state of great confusion and that during their 8 months in office they had approached their problems in an energetic and efficient manner.

During the last seven months there has been an increase of 25·7 per cent. production in one type of aircraft and 7·7 per cent. in another. It is pointed out that there has been a lack of understanding between the management and the workers and various steps for bringing about an improvement are suggested, including the appointment of a fully qualified Personnel Officer. It is emphasised that the speedy settlement of outstanding questions as to wages will assist in improving the relations between management and workers. Various detail improvements in accommodation are also suggested, but these are dependent on the possibility of providing the necessary buildings. It is further suggested that a more adequate scheme for training women workers should be installed.

It is understood that the Minister of Aircraft Production has approved the recommendations of the report.

RAILWAY AND OTHER MEETINGS

Madras & Southern Mahratta Railway Co. Ltd.

The 92nd ordinary general meeting was held at "Guildcroft," Epsom Road, Guildford on December 21, 1943, Brig.-General Sir Charles L. Magniac, C.M.G., C.B.E., Chairman of the Company, presiding.

The Chairman said: Before proceeding with the business of this meeting, I would like to mention that the Government of India has expressed the desire to terminate the Company's contract on March 31, 1944, that is 21 months in advance of the next option date. Negotiations are proceeding between the Board and the Secretary of State for India to determine the terms of the proposed acquisition and when these are settled, an extraordinary general meeting of the stockholders will be convened to consider the matter.

The Secretary (Mr. V. Craster, O.B.E.) read the notice convening the meeting and the auditors' report.

The Chairman: Capital expenditure during the year amounted to £53,351. Gross earnings were Rs. 1166·03 lakhs as compared with Rs. 961·46 lakhs, which shows a very considerable increase of Rs. 198·57 lakhs, mainly attributable to the war. Working expenses came to Rs. 517·67 lakhs, or about Rs. 67 lakhs more than last year. This is to be expected in view of the increase in receipts. Net earnings were Rs. 642·36 lakhs, showing an addition of Rs. 131·63 lakhs, which is very satisfactory. In my address to you last year, I referred to the question of the taxation in India of our guaranteed interest. This case was decided against the Company in the Indian Courts, but in view of the fact that the British Inland Revenue has agreed to grant Dominion Income Tax Relief on any Indian tax paid under this judgment, the Company will not suffer financially, as the tax paid in India will be refunded in this country.

The past year has again been abnormal. Our receipts constitute a record. Under coaching, they are partly due to military passenger traffic and under goods to movement of general merchandise and food grains of all classes, partly offset by a drop under groundnuts, kerosine, and petrol. Reports of sabotage on the line continued to be received. The prevalence of war conditions has placed additional burdens on all ranks of our staff in India and I feel it only right to bring to your notice the good work of our Agent and General Manager, Mr. C. G. W. Cordon, his officers, and subordinates. Under the authority given by the stockholders, an additional sum of £5,000 was added to the London Office Contingency Fund.

The audited results of working the company's and State lines for the first half of the year 1943-44 to September 30 last show an increase in gross earnings of about Rs. 102·83 lakhs over those of the previous year; working expenses are up by about Rs. 42·76 lakhs and net earnings are Rs. 60·06 lakhs higher. Prospects for the whole year are at present good, for up to November 30, gross earnings for the combined system are approximately Rs. 130·12 lakhs over those of the corresponding period of 1942-43.

The report and accounts were adopted, and the payment on January 1, 1944, of a dividend of 3 per cent. on the capital stock was approved.

Buenos Ayres & Pacific Railway Co. Ltd.

The ordinary general meeting was held at Winchester House, Old Broad Street, E.C., on December 16, 1943. Mr. J. A. Goudge, Chairman of the Company, in the course of his address, said that the leading feature of the year's accounts was the heavy increase in the cost of fuel. To take the salient comparison of cost of locomotive running—these are the yearly figures since the war began—£1,258,000; £1,531,000; £1,690,000; £2,047,000, or an increase of £800,000 in the annual charge for the year under review over that of four years ago. A continuance of even higher prices and greater scarcity had to be faced during the current year.

Argentine business conditions were flourishing and prices for her exports, especially meat and wool, were satisfactory; and the company had an increase in business over last year which had tended to relieve the urgent need to meet extra costs of working, which certainly would not decrease. The directors acknowledged with gratitude the excellent services rendered by the Local Board, Manager, and staff under the difficult conditions experienced during this trying period.

The report was adopted.

Argentine North Eastern Railway Co. Ltd.

The ordinary general meeting of the Argentine North Eastern Railway Co. Ltd. was held on December 20, 1943, at River Plate House, E.C.2. Sir Follett Holt, K.B.E., Chairman of the Company, who presided, said it was satisfactory to be able to record a substantial improvement in the year under review. Bearing in mind the enhanced cost of all materials, the increase in net receipts was good, as was also the fact that the ratio of expenses to receipts had dropped from 74·51 per cent. to 65·62 per cent. The increased net receipts rendered it possible to make in August last a payment on account of the arrears of interest on the "B" debenture stock.

Traffic receipts for the current year were being maintained at approximately last year's figures. As what was carried was either livestock, urgently required for food exports, or fruit, yerba, rice, timber, and other commodities in strong demand within Argentina, it was hoped that there would be no marked setback. Results of the current year must depend to some extent upon the haulage power available to deal with the traffic offering. The provision of fuel was also a constant worry and its cost was rising.

The report was adopted.

Entre Rios Railways Co. Ltd.

The ordinary general meeting of the Entre Rios Railways Co. Ltd. was held on December 20, 1943, at River Plate House, E.C.2. Sir Follett Holt, K.B.E., Chairman of the Company, in the course of his address, said that due largely to the internal prosperity of the Argentine, the result of the year showed a substantial improvement. The better results had been achieved despite difficulties which had had to be faced by the General Manager and his staff—rolling stock had been withdrawn from service in consequence of essential materials such as wheels and tyres for repairs being practically unobtainable and, in addition, many wagons were needed to convey from the northern part of Corrientes and elsewhere the very large quantity of wood used as fuel, and were therefore not available for public service. A modest increase in tariffs authorised by the Government had helped, but the economy retentions from employees' wages had to be suspended and additional contribution to the Employees' Pension Fund provided.

So far this year the gross receipts showed good improvement but the shortage of rolling stock and the rising cost of fuel must affect to some extent the results of this financial year.

The report was adopted.

Crompton Parkinson Limited

In his address at the recent annual general meeting, Mr. Frank Parkinson, M.I.E.E., the Chairman, said that, notwithstanding a decline of £134,994 in the net liquid assets of Crompton Parkinson Limited, those of the group as a whole had increased by more than £396,728 during the last four years, and this had been achieved notwithstanding the extension of the scope of the activities of the parent company by the acquisition of new subsidiary and associated companies and otherwise. The Board was fully alive to the necessity for taking all possible precautions to enable the company to be in the best possible position to deal with the post-war situation. The company was striving all the time to establish higher efficiencies in production methods, while maintaining and even improving the well-known standards of quality and design in its products. Total production had reached a new high record during the year ended September 30, 1943.

William Asquith Limited

Mr. Lewis Rhodes, the Chairman, presiding at the 23rd annual ordinary general meeting, said that the profit of £97,497 for the year to August 12, 1943, compared with £132,934 for the previous year. The main reasons for the decrease in profit were an increase in wages, the full effect of the Prices Control Order being in operation, and the result of the company having to concentrate on different types of machines, as compared with its standard lines of manufacture.

The dividend of 5 per cent. on the ordinary shares, less tax, required £2,039, and £10,000 was transferred to general reserve. The balance to be carried forward was £26,196, against £23,418 brought in. In spite of the heavy pressure put upon them every effort had been made to keep the plant and machinery in a high state of efficiency. On behalf of the Board he wished to thank all the members of the staff and workpeople for their loyal and efficient services.

Notes and News

London Transport Paper Salvage.—During 1943 some 800 tons of used tickets were salvaged by the London Passenger Transport Board.

Short Journeys.—A recent test by London Transport on a number of its Central bus routes showed that, of 6,793 fares paid, 5,230 were tendered by passengers making 1½d. and 2d. rides.

L.M.S.R. Traffic in 1943.—Over 25 million more persons booked at L.M.S.R. stations during 1943 than in 1942. Merchandise tonnage handled by the company was greater by 14 per cent. than in the previous twelve months; and nearly 40,000 special O.H.M.S. trains, for personnel and armaments, were run—an increase of 39 per cent.

Reported Nationalisation of San Paulo-Parana Railway.—According to a Buenos Aires report, the 172-mile San Paulo-Parana Railway is to be nationalised in the near future, with the object of improving the connection between Brazil and Paraguay. This line, which is at present owned by Parana Plantations Limited, extends from Ourinhos to Arapongas. A lengthy extension to the frontier of Paraguay at Guaira is under construction, as shown on the map we reproduced at page 14 of our January 7 issue.

The Slav Drava Valley Railway.—The Slavonsko-Podravska Železnica (Slav Drava Valley Railway Company) showed a loss of Kuna 958,000 for 1942. The headquarters are at Belisce (to the west of Osijek, in north-eastern Croatia). The company owns and works the following metre-gauge lines :—

Osijek—Belisce—Moslavina-Crnac—Mislavac—Cacinci—Humljani—Vocin	77 miles
Belisce—Prandavovci	14 ,,
Moslavina-Crnac—Noskovci	9 ,,
Mislavac—Slavonska Orahovica	4 ,,
Humljani—Slatinski Drenovac	5 ,,
	109 miles

Railway Accidents in Spain.—Thirty persons are stated to have been killed, and about sixty injured, on January 3, when a passenger train travelling between Leon and Coruña in Spain collided, in a tunnel near Torre (about 50 miles west of Leon), with a locomotive hauling two wagons. Six of the passenger coaches caught fire. The cause of the occurrence is believed to have been a failure of brakes. A second accident, involving the deaths of three persons, took place when an eastbound mineral train crashed into the locomotive with which the passenger train had collided, which had been derailed and thrown on to the adjoining track.

Transport Corps Rolling Stock Assembly.—On Tuesday last an opportunity was afforded by the U.S. Transportation Corps to inspect the manufacture of railway wagons and exhibit railway rolling stock. In an assembly shop, soldiers of the American and British army, most of whom were railwaymen in civil life, are engaged in assembling rolling stock. Pre-fabricated parts have been brought from America, and partially pre-fabricated for seven types of wagons are passed into the marshalling yards from the assembling line every hour. One battalion, of men from the Pennsylvania Railroad, has been turning out thirty wagons a day. The officer commanding the unit at the assembly centre is Lt.-Colonel H. U. Bates, former General Shop & Engine-house Foreman for the Pennsylvania Railroad. We hope to publish further details of the work performed at the centre in an early issue.

U.S.A. Rail Traffic in 1943.—Figures issued recently indicate that during the eleven months January-November, 1943, the U.S.A. railways handled approximately 732,000,000,000 ton-miles of freight, or between 13 and 14 per cent. more than in 1942. For 1943, passenger-mileage is estimated at 58 per cent. above that recorded in 1942.

New Swedish Train Ferry Launched.—A new train ferry, built to the order of the Swedish State Railways, was launched towards the end of last year at the Malmö shipyard of Kockum's Mekaniska Verkstad. The ferry is fitted with an icebreaker, to obviate the necessity of her being preceded by an icebreaker when operating in ice conditions. The vessel is of 3,060 tons deadweight, and is equipped with an engine of 5,800 h.p. designed to develop a speed of 15 knots. The new ferry is to replace the 13-year old Malmö-Copenhagen ferry now in service.

Argentine North Eastern Railway Co. Ltd.—For the year to June 30, 1943, gross receipts were £973,073 (£858,760), working expenses £638,518 (£639,863), and net receipts £334,555 (£218,897). Deducting exchange losses and differences £100,609 (£65,384) and adding sundry receipts of £99 gives a total income of £234,045 (£153,691). Interest and sinking fund instalment on the 5½ per cent. prior lien debenture stock and interest on the 5 per cent. "A" debenture stock have been paid as usual on the due dates. Deducting these payments and allowing for interest on arrears and other charges there remains a credit balance of £29,775 to be deducted from the £511,103 debit balance brought forward, leaving a debit balance of £481,328 to be carried forward.

Madras & Southern Mahratta Railway Purchase.—A circular to stockholders sets out the terms on which it is proposed by the directors, as a result of negotiations with the Secretary of State for India, that the contracts for the working of the railway be terminated on March 31, 1944, *i.e.*, 21 months in advance of the earliest permissible date provided for in the contract of March 24, 1937. The Secretary of State is to pay to the Company the capital sum of £5,275,000 in lieu of the source of income represented by the company's interest in the right to work the railway, and earn income thereby, up to December 31, 1945. Out of this £5,275,000 it is proposed that £5,200 be paid to the Directors for loss of their directorships and £11,800 be distributed among the London staff for loss of their employments. The directors expect to be able to make a payment to stockholders in April, 1944, of about £110 for each £100 of capital stock. An extraordinary general meeting of stockholders to consider these proposals will be held on January 19, at Winchester House, Old Broad Street E.C.2.

March Level Crossing Accident.—The District Coroner (Mr. J. R. Dawbarn) resumed and concluded on December 29, 1943, his inquiry, adjourned from October 22, into the accident which occurred at Middle Road level crossing, March, when the 10.20 p.m. L.N.E.R. express, Edinburgh to Colchester, ran at about 55 m.p.h. into a motor car. Three people were killed and two seriously injured. Mr. F. G. Scott, solicitor, King's Lynn, represented the railway company and Mr. A. E. Goss the N.U.R. One of the injured, a woman passenger in the car, had recovered sufficiently to give evidence. She said it was very foggy and she did not think the car stopped at the approach to the crossing. It had not done so the previous Saturday. She remembered nothing after seeing the railway lines until she heard the doctor speaking to her. Constable H. W. Read deposed to going to the crossing after the crash. The warning bell was not very noticeable at the hut, 73 yd. distant. The Coroner, summing up, emphasised that there was some discrepancy in the evidence and a doubt about the way in which the gates had been opened. The jury returned a verdict of "accidental death" in all three cases;

British and Irish Railway Stocks and Shares

Stocks	Highest 1943	Lowest 1943	Prices Jan. 11, 1944	Prices Rise/Fall
G.W.R.				
Cons. Ord.	65½	57½	61½	– ½
5% Con. Pref. ...	120½	108	118	+ 1
5% Red. Pref. (1950)	110½	106	107	–
5% Rt. Charge ...	137½	123½	129½	–
5% Cons. Guar. ...	135½	121⅞	128½	–
4% Deb.	118	107½	113½	+ ½
4½% Deb.	119	109⅞	115½	+ 2
4½% Deb.	124½	116	120½	+ 1
5% Deb.	138	127	130	+ 1
2½% Deb.	77	72½	73½	+ 1
L.M.S.R.				
Ord.	34⅛	28	33½	– ½
4% Pref. (1923) ...	66½	58	63	–
4% Pref.	80¼	73	78	+ ½
5% Red. Pref. (1955)	105½	102	102½	+ 1
4% Guar.	107	98½	102½	– 2½
4% Deb.	109½	103½	106	+ 1½
5% Red. Deb. (1952)	111½	108	109½	–
L.N.E.R.				
5% Pref. Ord. ...	12⅞	7⅜	10¾	– ½
Def. Ord.	5⅜	3⅜	5	–
4% First Pref. ...	66½	57½	62	–
4% Second Pref. ...	36½	30½	34½	–
5% Red. Pref. (1955)	99⅜	93	98½	–
4% First Guar. ...	102⅜	94	100	+ 1
4% Second Guar. ...	93½	85⅜	91½	+ ½
3% Deb.	86⅜	78⅜	81½	–
4% Deb.	109⅞	101⅜	104⅜	+ ½
5% Red. Deb. (1947)	106½	102	103	–
4½% Sinking Fund Red. Deb.	108	103½	104½	–
SOUTHERN				
Pref. Ord.	80	72½	77	+ 1
Def. Ord.	26⅜	20⅜	25¼	– ½
5% Pref.	119½	106½	117	+ 1
5% Red. Pref. (1964)	114	108½	113½	+ 1
5% Guar. Pref. ...	136	122	128	+ 1
5% Red. Guar. Pref. (1957)	117	109½	112½	–
4% Deb.	117½	106	111½	–
5% Deb.	137	126	127	–
4% Red. Deb. (1962-67)	112	106½	107½	–
4% Red. Deb. (1970-80)	112	107	103½	–
FORTH BRIDGE				
4% Deb.	109	104½	105	–
4% Guar.	105	102½	102½	–
L.P.T.B.				
4½% "A"	125⅛	114	119½	–
5% "A"	133⅞	123	128½	–
3% Guar. (1967-72)	100½	97	99	–
5% "B"	124	114	119½	+ 1
"C"	72	53	66	+ 1
MERSEY				
Ord.	34½	27	34	–
3% Perp. Pref. ...	68	59½	66	–
4% Perp. Deb. ...	104	102½	103	–
3% Perp. Deb. ...	83	78½	79	–
IRELAND				
BELFAST & C.D.				
Ord.	9	6	7½	–
G. NORTHERN				
Ord.	24½	16	22½	–
Pref.	—	—	44	+ 1½
Guar.	—	—	63	+ 3
Deb.	—	—	82	+ 1
G. SOUTHERN				
Ord.	30	9½	33½	+ 4½
Pref.	30	11	44	+ 4
Guar.	64	26½	63¾	+ 1¾
Deb.	68½	51⅜	87¾	+ 1½

§ ex-dividend

OFFICIAL NOTICES

AN OLD ESTABLISHED FIRM of Engineer's Agents, having well-appointed offices in Pall Mall, London, with an experienced Technical Sales organisation in direct contact with the principal Government Departments, railway undertakings, important industrial concerns, at home and abroad, and accustomed to negotiating large contracts, is willing to consider proposals from Provincial Manufacturers of repute in both the Mechanical and Electrical Engineering branches of industry who are seeking London representation on a payment by result basis. They are well placed for post-war reconstruction schemes, etc., in occupied and other territories. Equiries will be treated in strict confidence.—Engineers Publicity, Ltd., 3, St. James Square, London, S.W.1.

OFFICIAL ADVERTISEMENTS intended for insertion on this page should be sent in as early in the week as possible. The latest time for receiving official advertisements for this page for the current week's issue is 9.30 a.m. on the preceding Monday. All advertisements should be addressed to:—*The Railway Gazette*, 33, Tothill Street, Westminster, London, S.W.1.

with this the Coroner expressed his concurrence. The jury exonerated the train driver from all blame and expressed the opinion that a better warning system might be introduced and that the gatekeeper ought to be nearer to the bell. The solicitor for the company said that the regular gatekeeper was in the army and his wife working on the land. A member of the engineer's staff had taken over. Improved arrangements would be made.

Reported Nationalisation of the Avianca.—Recent reports from Colombia state that the control of the Avianca Air Company, the Colombian subsidiary of Pan-American Airways, has passed into Colombian hands. It is said that at Barranquilla, the main port on the Atlantic, two million dollars were subscribed for this purpose in 24 hours.

Fifth Railway Fuel-Economy Conference.—The concluding conference of the series which commenced on September 29 last, when the Minister of Fuel & Power opened the recent railway fuel-economy campaign, was held on January 12 at Charing Cross Hotel, and was attended by representatives of engineering departments of the British railways and the London Passenger Transport Board. Mr. V. A. M. Robertson, C.B.E., M.C., Civil Engineer, Southern Railway, presided, and two papers, on "Economy in Energy Consumption with Electric Traction" and "Fuel Supply Problems," were read by Mr. W. J. A. Sykes, Electrical Department, Southern Railway, and Mr. W. A. Worth, Chief Supplies Office, L.P.T.B., respectively. It is hoped to publish a summary of each of these papers in our next week's issue.

Photographic Exhibition of Railway Steamers.—The British railways are staging at the premises of Dean & Dawson, 81, Piccadilly, London, W.1, an exhibition of photographs showing the history of railway-owned steamships from the middle of the last century to the present time. The exhibition, which opened on January 5, will be there for some four weeks, open daily from 10 a.m. to 4 p.m. on weekdays, and until noon on Saturdays; admission is free. This exhibition shows not only the growth of the familiar Continental and Irish boats, but also their smaller brethren, many of them paddle-steamers, serving on the Clyde or connecting train services with the many islands round our coast. In addition there can be seen more specialised railway vessels, such as train ferries, car ferries, boats that can turn in their own length or move sideways, together with the humble cargo vessels and dredgers. These photographs also show some of the many railway vessels now on charter to the Government in their war-paint.

Railway Fuel-Economy Broadcast.—On January 6 a discussion was broadcast in the Home Service programme between Mr. M. G. Bennett, Chairman of the Railways Fuel Efficiency Committee, Mr. Felix Felton, of the B.B.C., and Mr. R. Keane, an L.M.S.R. firing instructor. The opportunity was taken to reiterate many of the important facts which have been brought out at the various recent railway fuel-economy conferences. For example, Mr. Bennett pointed out that the railways always had practised fuel economy in their own interests. Had there been no reduction in the consumption of coal an engine-mile between 1923 and 1938, 600,000 tons more coal would have been needed in 1938 than was used. Other fuel facts given in the broadcast were that the railways consume 16,000,000 tons of coal a year, in addition to gas, electricity, and oil; that they are collecting 10,000 tons of "char" from locomotives and reusing it in boilers; and that they are mixing coke with coal at the rate of 131,000 tons a year, efforts to bring which figure up to 500,000 tons a year are being made. It was revealed also that the railways use 2,000 million cu. ft. of gas for lighting alone, and that the rationing of fuel supplies to stations, offices, and other premises saves 13,000 tons a year.

Metropolitan-Cammell Wagons for Turkey.—In 1939 the Metropolitan-Cammell Carriage & Wagon Co. Ltd. secured a contract from the Turkish State Railways Administration for the supply of 300 pairs of hopper wagons for the conveyance of iron ore and coal for the Karabuk Steelworks. Despite the demand on the resources of the company for work of higher priority, it has been possible to make some progress with this important contract, and a number of the wagons are now in service. Because of the shipping position the wagons could not be despatched erected as originally visualised, but have been sent out partly dismantled and re-erected by the Turkish Railway Administration at its Sivas Works under the supervision of Metropolitan-Cammell technical representatives who went to Turkey in the early part of 1943 for this purpose.

Transport in Northern Ireland.—Mr. J. P. Herdman, a Director of the G.N.R. (Ireland), and a member of the Agricultural Inquiry Committee set up to recommend steps for the extension of agriculture in the Province, in a minority report states that the recommendation in the majority report that the Northern Ireland Transport Act of 1935 should be abandoned is drastic. It was made on the assumption that the Act was unworkable, but that assumption seemed hardly justified by the evidence tendered to the Committee. All that had been established was that the Act had not been worked. Without an inquiry such as had not been undertaken, as to why it had not been worked or as to where responsibility for that position lay, there would seem to be wholly insufficient grounds for recommending the extreme step of abandoning the existing law.

Contracts and Tenders

Below is given a list of orders placed recently by the Egyptian State Railways:—

Chance Bros. & Co. Ltd.: Opal glassware.
P. & W. MacLellan Limited: Wire steel.
Steel, Peech & Tozer Branch of the United Steel Cos. Ltd.: Tyres.
Siemens Bros. & Co. Ltd.: Lamp holders.
George Angus & Co. Ltd.: Brake lining.
Drawing Office Supplies Limited: Pens and pencils.
Thomas Bolton & Sons Ltd.: Copper bars.

The first two wagons received in Turkey under the 1939 Metropolitan-Cammell Carriage & Wagon Co. Ltd. contract for the Turkish State Railways Administration were inspected on September 7, 1943. Left to right: Bay Burhan, Foreman of the wagon shop; Eskisehir Bay Feyzullah Ulgur, Engineer, Sivas Works; Bay Edip Sirman, Chief Wagon Engineer, Ankara; Mr. J. Bayliss, Charge-Hand Erector, Metropolitan-Cammell Company; Bay Celalettin D. Bukey, Ankara Agent of Bernard Tubini, who represents Metropolitan-Cammell Company; Mr. E. P. Hubbard, Technical Representative, Metropolitan-Cammell Company

Railway Stock Market

The tone of Stock Exchange markets has been less firm, and in some sections a decrease in turnover was reported. Earlier gains have not been fully held at the time of writing, due to absence of improvement in demand, rather than to profit-taking, which appeared to be very moderate. Sentiment was assisted by the firmness in British funds, which on balance recorded a number of further gains, while features of strength were not lacking among industrial shares. At the time of writing, junior stocks of the home railways have lost earlier gains and have moved back to slightly below the levels of a week ago, so that price fluctuations have been within narrow limits. There were, however, further gains in prior charge stocks, which continued to attract attention on investment merits and yield considerations. Sentiment as to the junior stocks failed to respond to estimates that the official returns are likely to show net revenue of the main-line railways and London Transport at close on the £120,000,000 level for 1943—a record which may very well be exceeded in the current year. This would not affect the dividend position, as the surplus above the £43,400,000 fixed rental represents profit for the Treasury. It is apparent events have proved that under the rental agreement the Government drove a hard bargain with the railways and their stockholders. It is being assumed that the railways will be as liberal in the matter of dividends as possible within the limits of the fixed rental; but the only scope for better distributions is in regard to L.M.S.R. ordinary and L.N.E.R. second preference, in which cases the question of improvement (which can be only fractional) will turn on whether it is decided to maintain allocations to contingencies reserves at the same levels as a year ago. The fact that the fixed wartime rental is below "standard revenue" as based on the Railways Act of 1921 does not mean that the railways have in any way given up their right to standard revenue as defined in this Act. On the contrary, it is assumed that whatever the ultimate decision on organisation and control of transport after the war, it will be such as to give the railways reasonable scope for earning standard revenue and maintaining the higher charges in respect of wages, etc., which have developed during the war period.

Compared with a week ago, Great Western ordinary has eased from 62 to 61½ at the time of writing. On the other hand, in accordance with the general tendency in prior charges, Great Western 4 per cent. debentures were firm, and at 114 were fractionally higher on balance, as was the guaranteed stock at 128½, and the 5 per cent. preference moved up from 117 to 118. L.M.S.R. ordinary eased from 33⅜ to 33⅛; on the other hand, the 1923 preference was 63, compared with 62½ a week ago, and the senior preference 78¼, compared with 77; the 4 per cent. debentures were higher at 106, and the guaranteed stock gained a point at 102½; L.N.E.R. second preference moved back from 34½ to 34¼, but the first preference was better on balance at 62, compared with 61½. L.N.E.R. guaranteeds attracted further investment buying; the firsts improved from 99 to par, and the seconds from 90½ to 92. Moreover, higher prices were also made by this railway's 3 per cent. and 4 per cent. debentures. Among Southern stocks, the deferred, after touching 25⅜, eased to 25⅛, which compared with 25⅝ a week ago. Southern preferred, however, improved on balance from 76 to 76⅜; the 4 per cent. debentures were higher at 112½, as was the guaranteed stock at 128½ and the 5 per cent. preference at 117. London Transport "A" stocks held recent gains, and the "B" was better at 119¼; the "C" was 65⅜, as against 65.

The market in South American securities was unsettled by uncertainties as to the political position and by a vague report that the possibility of the imposition of sanctions against Argentina has been discussed. Later the undertone in stock prices tended to improve. Compared with a week ago, however, B.A. Gt. Southern has moved back from 14¾ to 13½ at the time of writing, the 5 per cent. preference from 28¼ to 27½, and the 4 per cent. debentures were 62. Moderate declines were also recorded in Brazilian stocks, and San Paulo ordinary was 57. Leopoldina debentures were 52½ and United of Havana debentures 27½. Canadian Pacifics were virtually the same as a week ago.

Traffic Table and Stock Prices of Overseas and Foreign Railways

	Railways	Miles open	Week ending	Traffic for week: Total this year	Traffic for week: Inc. or dec. compared with 1941/2	No. of Weeks	Aggregate traffics to date: Totals 1942/3	Aggregate traffics to date: Totals 1941/2	Aggregate traffics to date: Increase or decrease	Shares or stock	Prices: Highest 1943	Prices: Lowest 1943	Prices: Jan. 11, 1944	Yield % (See Note)
				£	£		£	£	£					
South & Central America	Antofagasta (Chile) & Bolivia	834	2.1.44	26,770	+ 200	1	26,770	26,570	+ 200	Ord. Stk.	15¼	10	13	Nil
	Argentine North Eastern ...	753	1.1.44	13,056	+ 3,918	27	378,408	350,976	+ 27,432	,,	7⅜	5	6½	Nil
	Bolivar	174	Dec., 1943	4,776	— 1,467	52	62,732	59,762	+ 2,970	6 p.c. Deb. Bonds	22½	18	21½	Nil
	Brazil	—	—	—	—	—	—	—	—		23½	19	20	Nil
	Buenos Ayres & Pacific ...	2,807	1.1.44	117,300	+ 7,200	27	2,547,600	2,451 240	+ 96,360	Ord. Stk.	8¼	5¼	7	Nil
	Buenos Ayres Great Southern	5,080	1.1.44	213,540	+ 41,340	27	4,294,3:0	3,897,780	+ 396,600	Ord. Stk.	17⅛	9⅛	14	Nil
	Buenos Ayres Western ...	1,930	1.1.44	48,720	— 2,400	27	1,383,540	1,404,960	— 21,420	,,	16	9⅞	12	Nil
	Central Argentine	3,700	1.1.44	173,124	+ 32,289	27	3,793,614	3,428,817	+ 364,797	,,	10⅜	6¼	9	Nil
	Do.	—	—	—	—	—	—	—	—	Dfd.	4⅞	3	4	Nil
	Cent. Uruguay of M. Video	972	1.1.44	38,162	+ 9,504	27	676,709	620,514	+ 256,195	Ord. Stk.	7⅜	4⅛	5⅛	Nil
	Costa Rica	262	Nov., 1943	19 893	+ 6,310	21	114,386	64,960	+ 49,426	Stk.	16	12¼	15	Nil
	Dorada	70	Nov., 1943	25,000	+ 8,470	44	243,607	173,705	+ 69.9 2	1 Mt. Db.	96	92	93½	6½
	Entre Rios	808	1.1.44	20,340	+ 3,438	27	525,276	493,314	+ 31.962	Ord. Stk.	9	5½	7	Nil
	Great Western of Brazil ...	1,030	31.12.43	22,000	+ 7,400	52	903,800	639,800	+ 264,000	Ord. Sh.	59/9	24/4½	30/-	Nil
	International of. Cl. Amer.	794	Nov., 1943	$565,434	+ $83.910	47	$6,589,280	$5,554,318	+ $1,034,962	—	—	—	—	—
	Interoceanic of Mexico ...	—	—	—	—	—	—	—	—	1st Pref.	2⅜	1½	1⅞	Nil
	La Guaira & Caracas... ...	22¾	Dec., 1943	6,985	— 2,575	52	97,885	90,370	+ 7,515	5 p.c. Deb.	90	80	87½	Nil
	Leopoldina	1,918	31.12.43	—	—	52	1,902,994	1,611,362	+ 291,632	Ord. Stk.	7⅜	4	5⅛	Nil
	Mexican	483	31.12.43	ps. 635,700	+ ps.94,500	27	ps.10,622,200	ps.7,695,900	+ ps. 2,926,300	Ord. Stk.	1⅞	¾	1	Nil
	Midland Uruguay	319	Oct., 1943	17,778	+ 2,984	50	65,802	50,786	+ 14,916	—	—	—	—	—
	Nitrate	382	31.12.43	6,749	+ 418	52	160,692	188,496	— 27,804	Ord. Sh.	83/9	71/3	72/6	Nil
	Paraguay Central	274	31.12.43	$65,421	+ $30,901	27	$1,421,637	$1,025,420	+ $396,217	Pr. Li. Stk.	75	51½	69	8⅛
	Peruvian Corporation ...	1,059	Dec., 1943	115,532	+ 32,487	27	637,187	497,667	+ 139,520	Pref.	17⅜	10⅜	11½	Nil
	Salvador	100	Oct., 1943	c 67,000	+ c 14,000	17	c 335,000	c 236,000	+ c99,000	—	—	—	—	—
	San Paulo	153½	26.12.43	50,167	+ 12,417	52	2,310,168	1,928,696	+ 381,472	Ord. Stk.	71	57	58½	3½
	Taltal	160	Nov., 1943	5,250	— 313	21	27,500	25,403	+ 2.097	Ord. Sh.	37/6	20/-	22/6	Nil
	United of Havana	1,301	1.1.44	42,365	— 16,235	27	1,226,451	1,182,741	+ 43,710	Ord. Stk.,	8⅛	3¼	3½	Nil
	Uruguay Northern	73	Oct., 1943	1,438	— 14	17	5,548	4,757	+ 791	—	—	—	—	—
Canada	Canadian Pacific	17,034	31.12.43	1,756,000	+ 195,600	52	59,421,400	51,372,800	+ 8,048,600	Ord. Stk.	18	13⅞	16½	Nil
India†	Barsi Light	202	Aug., 1943	15,285	+ 2,003	22	107,055	76,587	+ 30,468	—	—	—	—	—
	Bengal-Nagpur	3,267	Oct., 1943	1,001,025	+ 138,600	30	7,209,525	6,162,825	+ 1,046,700	Ord. Stk.	104½	101¼	102½	3⅝
	Madras & Southern Mahratta	2,939	10.10.43	247,050	— 107	28	5,325,600	4,541,813	+ 783,787	,,	110	106	108½	6½
	South Indian	2,349	31.10.43	203,679	+ 17,598	30	4,214,375	3,709,442	+ 504,933	,,	105½	101½	105½	4½
Various	Egyptian Delta	—	30.11.43	20,860	+ 4,373	36	376,410	292,342	+ 84,068	Prf. Sh.	6⅛	2⅞	4½	Nil
	Manila	—	—	—	—	—	—	—	—	B. Deb.	45	32	42½	8⅝
	Midland of W. Australia ...	277	Oct., 1943	33,998	— 1,095	17	135,691	119,414	+ 16,277	Inc. Deb.	101	93	99	6⅞
	Nigerian	1,900	30.12.43	68,456	+ 7,866	26	1,933,466	1,833,420	+ 160,046	—	—	—	—	—
	South Africa	13,291	30.10.43	825,805	+ 44,197	31	25,562,333	23,650,797	+ 1,991,653	—	—	—	—	—
	Victoria	4,774	July, 1943	1,404,891	+ 86,055	—	—	—	—	—	—	—	—	—

Note. Yields are based on the approximate current prices and are within a fraction of ⅛ Argentine traffics are given in sterling calculated @ 16⅔ pesos to the £
† Receipts are calculated @ 1s. 6d. to the rupee § ex dividend